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THE INFLUENCE OF FOCAL INFECTION IN RELATION TO TUBERCULOSIS

With Special Consideration of Myocarditis

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Focal infection is a term applied to infection in which infectious organisms exist in circumscribed, confined areas in certain tissues. From these primary foci metastasis occurs. The tissues more frequently the sites of primary focal infection, are the tonsils, peridental tissues, nasal sinuses, fallopian tubes and prostate gland. The tonsils, peridental and nasal tissues are frequently infected by the same bacteria coincidentally; what is said of infections of one of these tissues may be said of the others, and the importance of the care of each is great.

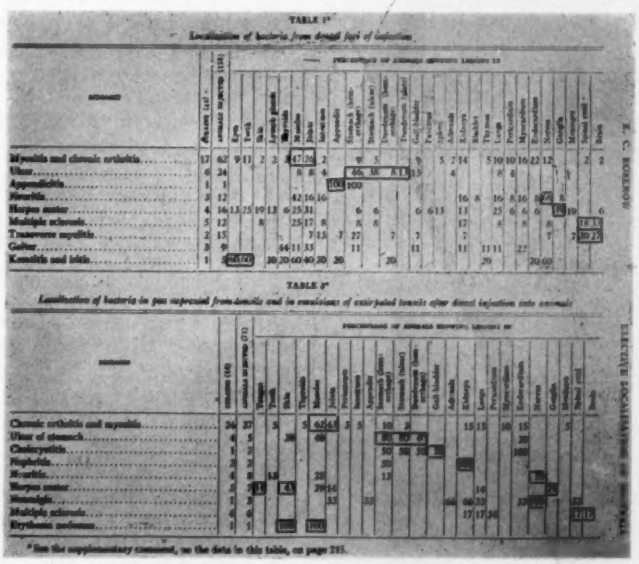

Figure 1. Reproduced from Elective Localization of Bacteria. —E. C. Rosenow.

By metastasis the bacteria become etiological factors in inflammatory dsiorders,—most frequently chronic—of the tissues of the myocardium, endocardium, blood-vessels, tendons, joints, muscles, kidneys, intestinal tract, lungs, peribronchial tissues, lymph nodes, etc. (Fig. 1, Chart). Actively progressive pulmonary tuberculosis rarely exists as a purely tuberculous infection. Infection by the pyogenic organisms are of frequent occurrence within the tuberculous area. Infections elsewhere in the body add to the bacterial toxic load. This is manifest by digestive disorders, nervous phenomena, cardiac functional disturbances, et cetera. By eliminating infectious foci in the body this bacterial load is reduced. By sustaining vital organs or reducing stresses brought

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Figure 2. Normal peridental membrane and its relation to the cementum and alveolar process. (I) peridental membrane; (II) cementum; (III) alveolar process. Observe the irregular thickness of peridental membrane and the consequent irregular line between the cementum and the alveolar process.

Figure 3. The relations between the teeth, peridental membrane and maxilla near apex. Observe how the peridental membrane (I) on the side is attached to the cementum (II) and on the other to the bone (III) in an irregular line, extending into adjacent cancellated spaces (IV). This anatomical relation favors extension of infection into aevoli, resulting in resorption of the aevolar process; (V) Dentin.

upon them, the resistance of the body to infections is maintained or increased.

The relation of the function of the heart to the progress of tuberculosis is of sufficient importance that I have deemed it wise to consider myocarditis due to focal infections worthy of special consideration at this time.

In considering the influence of peridental infections occurring co-incident with tuberculosis, I desire to review briefly the clinical history of tuberculosis as it most frequently occurs in persons in whom it is manifested clinically during adolescence and adult life. Primary tuberculous infection is almost universal in childhood. It becomes arrested, but produces recognizable symptoms in only a small percentage of cases. In all who are not overwhelmed by the initial infection, a degree of resistance is established.

Active tuberculosis may recur and become arrested, with or without manifesting symptoms. Reactivation is frequently due to stresses. Stresses may be divided into:

General Stresses.—Unsanitary surroundings, undernourishment, anxiety, vicious habits, et cetera.

Mechanical Stresses. — Physical strain thrown directly upon latent foci.

Bacterial Stresses.—Involving (a) the tuberculous foci; (b) remote foci.

Frequently, mechanical and bacterial stresses co-exist; this is especially true if mechanical forces have been the earlier reactivating agency. Recovery may be interfered with by bacterial infection associated in the tissues in which the active tuberculous infection exists, and also by the existence of bacterial infection in tissues remote from the tuberculous foci.

Chronic infection of the peridental tissues (Figs. 2 and 3) may be divided into intraosseous and extraosseous. From these foci metastasis may take place through either the blood stream or the lymphatic system, and thereby develop chronic disease in any tissue of the body, at a distance from the primary focus of infection.

Intraosseous infections (Fig. 4) are most frequently manifest in the peripheral peridental membrane, involving the tissues adjacent to the roots of the teeth as dentoalveolar abscesses (dental granuloma). Secondary foci are of frequent occurrence from this source.

Extraosseous infections (Figs. 5 to 8) include chronic inflammation of the peridental membrane, alveolar process and gingiva. The later stages of this type of infecton have been known as pyorrhoea alveolaris, "flow of pus from the alveolus." A more comprehensive definition, which more nearly represents our present conception of the condition, is: "The term 'pyorrhoea alveolaris' is generally accepted as indicative of inflammatory disorders in the investing tissues of the teeth, which, if not controlled, eventually end in their exfoliation."

It is important that the causes and early signs and symptoms of this condition be recognized at the earliest possible opportunity in order that the conditions may be corrected. Among the causes which may

Fig. 4.

Fig. 5.

Figure 4. Intraosseous infection. A large dento-alveolar abscess (I). This had developed so insidiously that patient experienced no local symptoms. Its existence was discovered during an examination for the cause of persistent pains about the right shoulder joint for about two weeks, not accompanied by symptoms of an acute condition. Note also the overhanging crown with the resulting extraosseous infection and destruction of the peridental membrane and resorption of the alveolar process to the extent that the tooth has lost about one-half of its bony support. The symptoms disappeared after extraction of the tooth and have not returned after an interval of two years.

Figure 5. Extraosseous infection deposits (I). There existed a slightly swollen red line along the gingival margins. Observe the resorption of the alveolar processes (II). This patient complained of progressive weakness and came for examination fearing pulmonary tuberculosis. We failed to find evidence of an active tuberculous condition, but we found a chronic myocarditis which was sufficient to account for the feeling of weakness. Her blood pressure was: recumbent, systolic 110, diastolic 70; on rising to standing, systolic 100, diastolic 85. Following treatment of the peridental condition the symptoms gradually improved and the heart, which was of the narrow "drop-heart" type, slowly approaching the normal condition in function and form. These deposits are rarely located so that they are seen in the radiograph; however, they usually exist in the presence of chronic marginal gingivitis.

Fig. 6.

Figure 6. Chronic inflammation of the gingiva. The epithelial prolongations in the subjacent connective tissues elongate as the result of the continued low degree of irritation. The connective tissue stroma has lost its characteristic appearance and the cells and fibers which were present under normal conditions have been replaced by inflammatory cells; i. e., mononuclear wandering cells comprising mononuclear leukocytes, lymphocytes and plasma cells and polymorphonuclear leukocytes in small numbers, a. a, elongated epithelial projections; b, b, round cell infiltration. Mast cells are also to be located under the higher magnifications (Endelman).

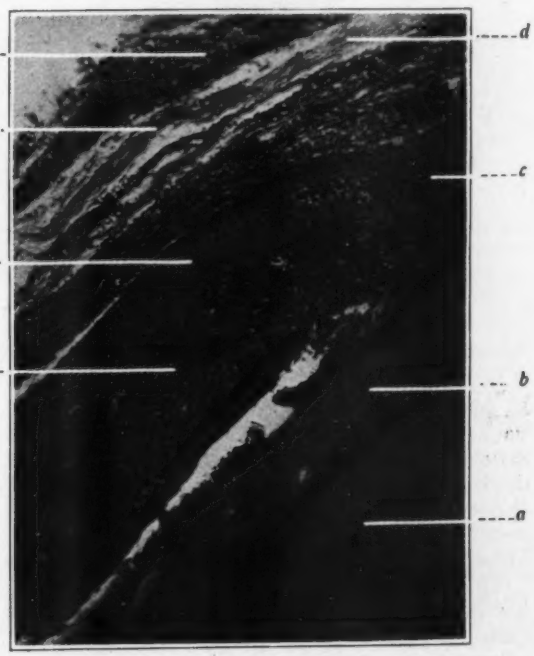

Fig. 7.

Figure 7. Gingivitis, chronic, advanced stage, the infection is progressing toward the peridental membrane, a, dentin; b, cementum; c, c, stratified squamous epithelium lining subgingival space; d, d, fibers of peridental membrane in the gingiva; e, e, round cell infiltration. (Endelman).
Illustrates nature's effort to limit extension of infection.

FOOTNOTE—For minute anatomy and detailed pathology the reader is referred to works on anatomy and pathology. The author acknowledges courtesies extended to him by the authors and publishers of General and Dental Pathology, Endelman and Wagner,—C. V. Mosby Co. Several of the cuts have been reproduced from this work.

For more detailed classification the reader is referred to works on dental pathology.

Figure 8. Progressive chronic gingivitis. a, cementum; b, space produced by detachment of cementum from dentin in process of decalcification and sectioning; d, fibers running from peridental membrane into gingiva; e, f and g, stratified squamous epithelium lining internal surface of gingival cul-de-sac; h and i, round cell infiltration in gingiva (chronic inflammation) progressing in the direction of the fibers of the peridental membrane at j and d. (Endelman).

be mentioned are subgingival deposits (salivary and subgingival calculi), which produce mechanical irritation due to ill-fitting dentures, fillings, etc., and chemical irritation due to decomposition of food debris accumulated by permanent bridges, overhanging crowns, etc.

The work of Rosenow of the Mayo Clinics, confirmed by others, has been of great value in that he demonstrated the selective action, for certain tissues, by given strains of bacteria from foci of chronic infections. From his report, I selected a group of reports of 666 animals which were infected with organisms from foci of infection from patients suffering from secondary lesions in different tissues. The animals developed infections in corresponding tissues in an average of about 75 per cent (Fig. 1).

During the past few years the writer has had occasion to make examinations of children who have been unable to satisfactorily perform the prescribed gymnasium work in the schools. Most of these children had been regarded as lacking in energy; they may have been studious, but had gradually formed the habit of avoiding amusements which required physical exercise. Upon fluoroscopic and stereoscopic radiographic examination, I was impressed with the frequency of the occurrence of the "asthenic" or "drop heart," an elongated and narrowed condition of the heart, or, if the condition has progressed further, a broadening of

the lower portion of the heart shadow. This change of shape is apparently greatest in the ventricles, the right ventricular movement frequently being observed, the fluoroscope showing the synchronous contraction of the right and left ventricles. Normally the right border of the heart shows the right auricle only. In every case I found co-existing foci of chronic infection. These infections are apt to be permanent unless treated.

Green, in Medical Diagnosis, states that "the drop heart" is one manifestation of a general visceroptosis and may or may not constitute its dominant feature clinically and anatomically; that no ill health may necessarily develop as the result, but that symptoms tend to develop under conditions of impaired nutrition. When we consider the prevalence of chronic infections which fail to manifest local symptoms and which, for this reason, are not discovered early, and the influence of these chronic infections upon the general muscular system, we may well consider whether these infections may not have been causative factors in bringing about the changed conditions of these organs, rather than having been due to poor nourishment and development only.

The heart, by reason of the constant demand made upon its musculature, and its sensitiveness to toxins, acute and chronic, is prone to manifest symptoms. The selective action of streptococcus viridans for the heart muscle is well known. Other infectious organisms may co-exist with streptococci or may be the chief cause of infection. These myocardial changes continue into adult life, if the infections are not cared for, and in many instances are progressive.

The evidence of physical weakness of the heart is frequently manifest by low pulse pressure. In the adult this is frequently systolic 100-110 and the diastolic 70-75 in the recumbent position, pulse pressure 25-40. A markedly decreased pulse pressure will be observed to occur upon rising to a standing position in cases of myocardial weakness; the systolic may be 90-100, diastolic 70-90, pulse pressure 10-30, accompanied by a sense of weakness. In childhood and advanced age these changes correspond to the given age. I have observed this condition improve or grow worse with the decrease or increase of intensity of focal infections. Not all persons suffering from chronic focal infections, suffer from these changes to a degree which seriously inconveniences them, but certainly many who suffer from this type of myocardial change have foci of chronic infections of the nasal cavities and accessory sinuses, the tonsils or investing tissues of the teeth.

Hearts suffering from the foregoing described conditions are easily subject to greater or less dilatation through physical stress, with the accompanying unpleasant symptoms. In some of these persons who have been continuously only slightly overworked a slight degree of chronic dilatation occurs with increasing shortness of breath even to the condition of fainting upon moderately increased exertion.

With relief from infection, rest, and later properly graduated exercise, improvement often occurs. The accompanying illustrations will aid in visualizing the selective action of focal infections, pathology of the peridental tissues and the successive stages of myocardial changes continuing into adult life.

The influence of infection by the spirochaeta pallida, in the production of chronic myocarditis, should be borne in mind. Prof. A. S. Warthin, University of Michigan, has repeatedly demonstrated the presence of these organisms in this condition.

The x-ray aids us to visualize the changed form of the heart and may serve as an aid in diagnosing this condition, but should not be solely relied upon for making a diagnosis. The radiographic observations made by us, have all been during forced inspiration.

Tracings of approximate average normal heart shadows were made from stereographic films of different chests. These were applied upon the pathological forms of hearts, approximating corresponding size and shape of chests under observation for comparison. The illustrations show the progressive changes in the contours of the hearts. Other qualities of heart functions should be observed.

CONCLUSIONS

Foci of infection of the peridental tissues should be diagnosed early.

Slight persistent swelling of the gingival margins is indicative of extraosseous infections. This condition is amenable to treatment, if recognized and treated early, and the patient saved from the chronic toxic condition incident to more extensive infection.

The x-ray is invaluable in the diagnosis of extraosseous and interosseous peridental infections; however, it should not be re-

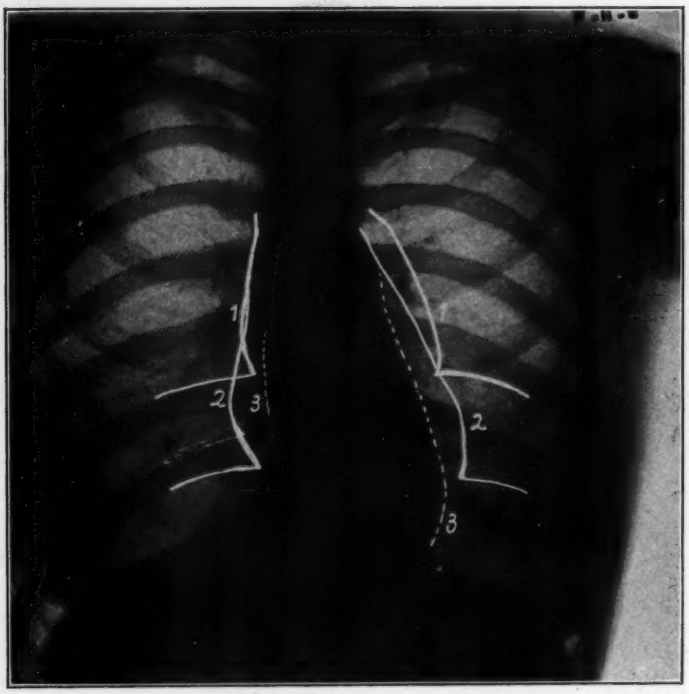

Figure 9.—Young women of slender build. Radiographs taken during forced inspiration. Upper cardiac outline (1), of normal heart, is a person about the same age and weight, short, stout build, applied on this chest; this gives contrast with middle outline (2), indicating normal cardiac outline of this chest; note width of intercostal spaces. The dotted line (3) indicates stereoscopic cardiac outline of a condition frequently met with in the underweight, adolescents. This condition has frequently been found to have been associated with foci of chronic infection of the investing tissues of the teeth, the tonsils or nasal passages and sinuses; not infrequently more than one region is infected.

In this type of heart the action of both ventricles is plainly visible in the fluoroscope, in the lower portion of the shadow, contracting and dilating at the same time, while the action of the auricles are observed toward the top. It is the change in the ventricles which takes greatest part in these myocardial changes. As time goes on the tendency of this type of heart is to yield to strain and we may observe the gradual dilation of the lower portion of the ventricles, more frequently the left.

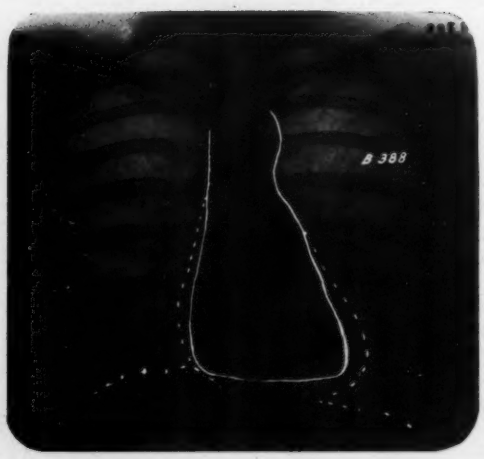

Figure 10.—Female, age 22. Student, Junior in University. History.—Gradual loss of endurance, most noticeable and increasing in degree during past year. During past two months had to stop for short rest on each flight of stairs. Pulse 100 or over when taken at rest. Otherwise felt well. No cardiac valvular lesion observed during examination. Pulse feeble 110.

Blood Pressure: Reclining, systolic 100, diastolic 75. Upon rising felt dizzy, systolic 90, diastolic 80, very feeble, recovered in 2 minutes.

Infected Tonsils: Extraosseous infection and extensive intraosseous infection of peridental tissues, with three devitalized teeth. Infected foci treated, and exercise restricted; returned to school after three months. Is now teaching physical development in one of the large schools.

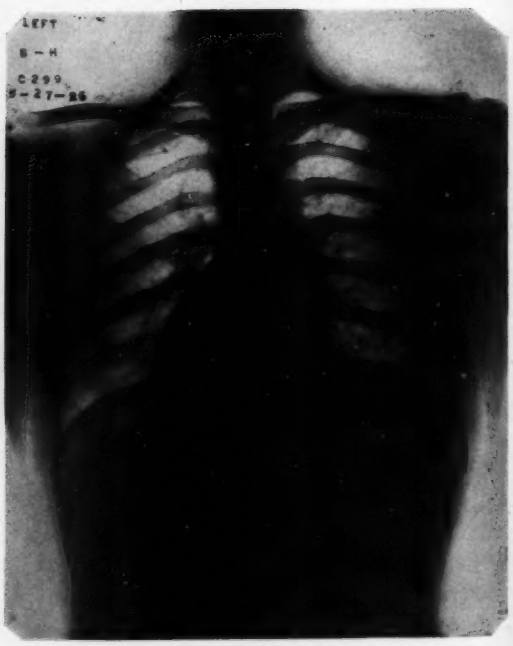

Figure 11.—History of chronic tonsillitis and appendicitis, both operated; chronic gingivitis which still exists. Acute pulmonary tuberculosis which became arrested two years ago. In college during past year. Complains of shortness of breath upon exertion. Blood pressure, reclining systolic 110, diastolic 70; upon rising systolic 100, diastolic 80; note pendulous heart with broadening of ventricular region.

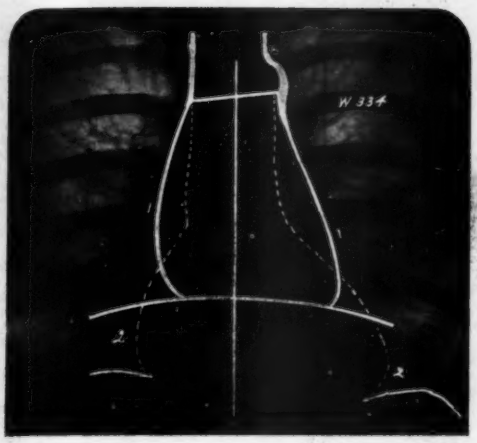

Figure 12. Radiographs taken during forced inspiration. Note long narrow upper portion of heart and distended ventricular area. In the fluoroscope the tired heart appeared to wallow upon the diaphragm. Long standing infection of peridental tissues. Had been in good clinical health until past few months, when ill defined symptoms of toxic conditions began to be manifest. Wassermann negative. Following the extraction of four teeth which were surrounded by extensive chronic infection with pyorrheal pockets, pain developed in the precordial region, with slight extension down the left arm, no cardiac murmurs. Unable to sit up for a week. Blood pressure, systolic 86; diastolic 70. Note ventricular changes.

Several teeth, surrounded by badly infected tissues, were later extracted, one only at an operation. The peridental tissues were treated before extraction to reduce the infectious material to the minimum. The interval between extraction was one week or more. After a year the condition is markedly improved and the symptoms have disappeared.

There exists evidence of marked peribronchial infiltration of the type frequently seen in persons who have suffered from chronic pyogenic infections of the tissues of the upper respiratory and digestive tracts.

Figure 13. Male, age 61. Radiograph taken during forced inspiration. History of long standing severe focal infection of tonsils and peridental tissues. Gave history of attacks of angina pectoris. Examination, including electrocardographic examination by Dr. Stanley Granger found condition favorable for angina pectoris. No valvular murmurs. Blood pressure, reclining, systolic 160, diastolic 100, standing 160-110. Wassermann 4 plus. Note character of aortic and ventricular changes. Patient later died of angina pectoris.

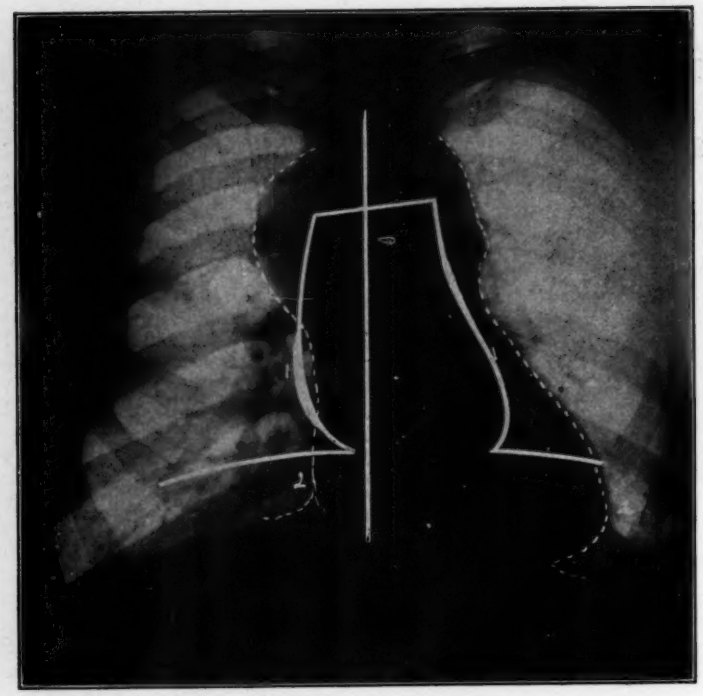

Figure 14. Male, age 66. Radigraph taken during full inspiration. Aneurism of Aorta.

No marked focal infection observed. Patient had recently noticed an uneasy sensation in his chest, accompanied by an increasingly annoying spasmodic cough. Physical signs of thoracic aneurism. Blood Wassermann, four plus. Syphilitic aortitis is a frequent cause of aortic aneurism. Note ventricular hypertrophy with the preservation of normal ventricular form. Observe the distorted ventricles of Figures 10, 11 and 12.

The narrow elongated aortic region with the distorted ventricle appears to occur more frequently in association with pyogenic focal infection; the widened aortic region with the dilated ventricles are apparent in the case illustrated by Figure 13, a patient in whom both pyogenic and luetic infection were demonstrated.

Taking all of our observations into consideration it appears to us that broadened aortic regions may occur with distorted ventricular regions in patients in whom positive Wassermann reactions may not be demonstrable. The existence of a markedly broadened aortic region with normal shaped ventricles (may be hypertrophied) occurred most frequently coincidently with positive Wassermann reactions.

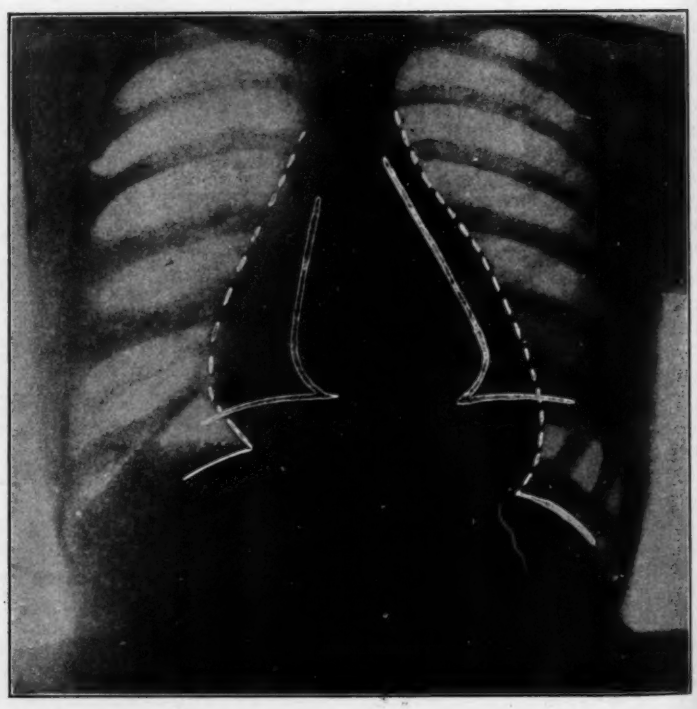

Figure 15. Observe the condition of symmetrical cardiac hypertrophy in advanced case of compensated mitral insufficiency.

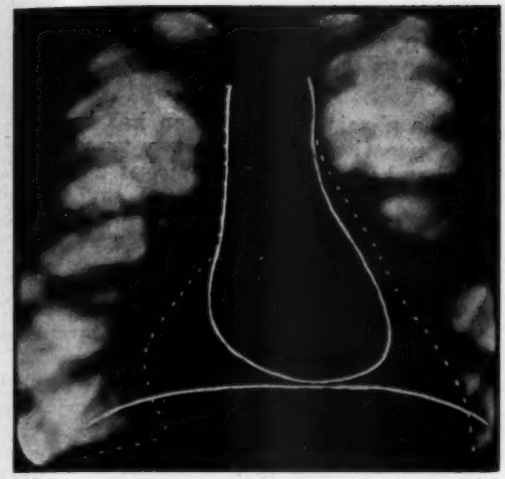

Figure 16. Case of Mitral insufficiency with compensatory hypertrophy in which decompensation is taking place, observe the beginning of dilatation of the right and left ventricles.

Figures 15 and 16 illustrate changes in form of heart in chronic endocarditis for comparison with the foregoing changes shown in chronic myocarditis. Observe the condition of symmetrical hypertrophy in advanced case of mitral insufficiency.

lied upon exclusively. The beginning of the infected focus is microscopic in character and has existed for a comparatively long period of time when it can be seen in the radiograph.

Resorption of the alveolar processes, as observed in the radiograph, is evidence of extraosseous infection of long standing.

When operative procedure is necessary for relief of infections of the peridental tissues, it should be limited to small areas. The treatment of pyorrrhoeal pockets previous to extractions will, in many instances, relieve the patient from absorption of excessive toxins incident thereto. If the infection is extensive, it is safer in the beginning of treatment to treat only one or two teeth at a sitting; the interval between treatments should probably be not less than five days.

Flooding the system with bacteria or their toxins, may be a determining factor in an acute exacerbation of chronic myocarditis, tuberculosis or other chronic infection.

Syphilitic infection of the myocardium should not be overlooked.

DISCUSSION

DR. F. F. MILLER, Miami, Ariz. (opening): I just want to say that the last two papers have been extremely interesting. I have been very much impressed, since coming to Arizona, with the rarity, as far as my work is concerned, of joint and bone tuberculosis. I do not see very much of it. In children in whom we may expect these particular types of infection, I find we get pulmonary tuberculosis more commonly than we might expect. I have wondered whether there is a sort of helio-phylaxis in the case of rickets in children, so that they are more or less immune to glandular and bone tuberculosis. We have, where we are, a large Mexican population, and tuberculosis among them is quite common, yet glandular tuberculosis or tuberculosis of the superficial glands, is comparatively rare. I cannot say that I have ever seen very much of it. It would seem to me that if there is any particular class of people to whom it is racial, it would be the Mexicans.

In regard to Dr. Browning's paper, as to teeth and their focal infection, I want to cite a little experience I had the other day. An individual came to me and asked me to make a very careful examination and tell him if there was any possibility of his coming down with tuberculosis soon. In the conversation which ensued, it developed that in his family several members had died of tuberculosis at his particular age. He was the fourth member. We are very much struck with that particular age which goes down in medicine and literature as the dangerous age. It is possible in this particular family, that tuberculosis might be stimulated by the development of focal infection about the particular age my caller had reached. I was not familiar with the family history other than this. We all know about people who live to be along towards middle age without sickness and then, for some unaccountable reason, a degenerative disease develops.

(NOTE:—The further discussion of this paper has, unfortunately, been lost, and cannot be supplied.)

PERSONALS

DR. JOHN J. McLOONE, of Phoenix, spent the week of September 13th in Colorado Springs attending the meeting of the American Academy of Ophthalmology and Oto-Laryngology. Dr. McLoone was elected to membership in the Academy. During the month of October, Dr. and Mrs. McLone will visit New Orleans, Philadelphia, New York and Montreal. In Montreal Dr. McLoone will attend the annual meeting of the American College of Surgeons.

Among those attending the National Tuberculosis Association, in Washington, October 4th to 7th, were DR. AND MRS. JOHN W. FLINN, of Prescott and DR. AND MRS. SAMUEL H. WATSON, of Tucson. The Executive Secretary of the Arizona Tuberculosis Association, Mr. T. C. Cuvellier, also attended this meeting.

DR. WM. A. SCHWARTZ, of Phoenix attended the annual meeting of the Academy of Ophthalmology and Oto-Laryngology, at Colorado Springs, the middle of September.

DR. C. B. PALMER, of Phoenix, is attending the Congress of Surgery and American College of Surgeons, at Montreal, the latter part of October.

DR. WILLIAM LEMING has opened an office in Santa Fe, N. M., for the practice of eye, ear, nose and throat work. Dr. Leming has been practicing in the vicinity of Tucumcari, N. M.

DR. JAMES A. ROLLS, of Stanta Fe, N. M., recently made a trip to the Mayo Clinic at Rochester, Minn., where his daughter is a member of the laboratory staff.

Governor Hannett appointed DR. ROBERT O. BROWN AND DR. GEORGE LUCKETT from Santa Fe among those who are to represent New Mexico at the National Tuberculosis Association meeting to be held at Washington, D. C., October 4-7. DR. FRANK E. MERA also attended the meeting.

GALL-BLADDER DISEASE

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The gall-bladder has, with new knowledge, come to a position of increasing importance. It is a generally accepted fact at the present time that such diagnoses as gastritis, gastralgia, indigestion, hyperacidity and biliousness, are not clinical entities, but merely represent symptoms of some definite pathological condition. Clinical experience from the meeting of the diagnostician and the surgeon at the operating table, combined with postmortem findings, has thrown more or less suspicion on the increasing prevalence of gall-bladder disease.

Until very recently, if the diagnosis of cholecystitic disease was made, it was very often made by the process of exclusion. That is, we excluded such diseases as peptic ulcer, appendicitis and carcinoma, and then made the diagnosis of cholecystitis. And while it is often said that old ways are the best, and even though the clinical diagnosis should always be accepted above laboratory diagnosis, nevertheless certain limitations are always evident. For example, if we did not have the Wassermann test today, how many cases of syphilis would have to go undiagnosed. The introduction of x-ray some years ago, combined with the use of the opaque meal, revealed many interesting facts in regard to the gastro-intestinal tract. In spite of this, however, while it disproved as fallacious a great many of our former conceptions of symptoms as resulting from such conditions as enteroptosis, it must be said that it was very disappointing because it failed so many times to demonstrate with any degree of accuracy the main and most prevalent cause of intra-abdominal disease. It is estimated that gall-bladder disease produces at least thirty per cent of all gastro-intestinal disturbances. Time and time again the gastro-intestinal x-ray reported negative findings. But now, with the aid of cholecystography, we are able to visualize the gall-bladder and watch its function over a period of from twenty-four to forty-eight hours and even longer. While it may be easy enough to say to a patient, "You have a diseased gall-bladder," if we are really conscientious we will often add, "You have an infected gall-bladder because you do not have certain other things and that is the only thing left for you to have." And we have had to do this a great many times where a physical examination has been entirely negative, and even the presence of pain has been lacking. It makes a tremendous difference when you can say to the patient, "You have a diseased gall-bladder because we can it in the x-ray."

I will try to correlate the clinical findings with the cholecystographic findings in ninety-four cases. I will not attempt to say what constitutes a positive x-ray finding. I will merely say that when Graham and Cole first introduced this method they thought the diagnosis of gall-bladder disease would be interpreted in terms of morbid anatomy, but it is generally admitted now that the interpretation is physiological. That is, the ability of the gall-bladder to functionate normally or abnormally, is by far the most constant finding.

In these ninety-four cases, five received the dye intravenously, and the remaining eighty-nine orally. In fifty-nine of these cases a positive clinical diagnosis has had to be made by exclusion, that is, at no time during observation has it been possible to elicit tenderness over the gall-bladder region, nor have these patients given a history of acute gall-bladder attacks or a history of jaundice. The diagnosis has been arrived at by excluding peptic ulcer, and carcinoma, and on the history of a more or less prolonged chronic type of dyspepsia, with food selection, early distress after eating, gaseous indigestion, belching, etc. Eighteen of these cases, in which there was neither radiological nor clinical evidence of cholecystitic disease, have been examined routinely. In three more cases the diagnosis has been undetermined. Therefore, in eighty out of the ninety-four cases the clinical and radiological diagnoses have coincided. In seven cases we have made a positive diagnosis of gall-bladder disease in which the x-ray examination was negative. This has been done by seeing the patient in an acute attack of gall-bladder colic or where the history of jaundice has been obtained. Two of these seven cases have been verified at operation. On the other hand, while it has been said that in fifty-nine cases both clinical and radiological evidence coincided, the clinical evidence in at least one-third of these has been based on such symptoms as sour stomach, constipa-

Read by invitation before the New Mexico Medical Society at its Fourty-fourth Annual
Read by invitation before the New Mexico Medical Society at its Forty-fourth Annual

tion or diarrhea, and symptoms much more suggestive of intestinal disturbance than of gall-bladder disturbance. For example, here are two definite cases of gall-bladder disease and significant because they have been in two young adults:

Case 1. W. A., nurse, age 21; running a daily temperature of 99.6. Came to Phoenix for her lungs. Occasional spells of diarrhea and general abdominal cramping. X-ray of chest definitely negative. Gall-bladder demonstrated with dye to be elongated, and definitely visible throughout 36 hours of observation, and even larger at the end of 36 hours than at the end of 12 hours.

Case 2. W. H., stenographer; age 22. Appendix removed two years ago for stomach trouble. Secondary anemia. Spells of gaseous indigestion. Absolutely no evidence of tenderness over gall-bladder. X-ray with dye shows it to be enlarged and shadow definitely persistent throughout 36 hours of observation. During an acute attack icteric index rose to 15; previous examination showed it to be 8.

One word about icteric index, which is an index of latent jaundice. The technic of it is described by Van-den-Bergh in Journal of the A. M. A. of April, 1922. It depends on the presence of hyperbilirubinemia. This occurs in hemolytic processes of the body, such as pernicious anemia, hemolytic jaundice, and several other general conditions. And it also occurs in disturbances of the biliary system. Using a certain colorimeter as a guide the normal range of bilirubins in the blood is 4 to 6, while latent jaundice lies between 6 and 15. Above 15 clinical jaundice begins to appear. An increase in the range of latent jaundice is very definite diagnostic evidence of gall-bladder disease, if it occurs during an acute stomach upset. On the other hand, if the icteric index is normal it is to be disregarded just the same as the leukocyte count. The icteric index is very often normal in a case of simple gall-stone colic, unless, of course, the stone produces obstruction. On the other hand if there is an acute inflammatory process, or an acute exacerbation of a chronic process in the gall-bladder, and especially if more or less cholangitis is present, there will almost certainly be an increase in the index. Also, the increase is most liable to be greater during recovery, the same as jaundice is most liable to appear a day or two after the gall-bladder attack.

In only eight cases has a diagnosis of peptic ulcer been made. This is about the correct proportion. One out of twelve patients complaining of stomach trouble has peptic ulcer. In four cases in which the diagnosis of gall-bladder disease has been made, a previous diagnosis of peptic ulcer has been made and confirmed by x-ray examination. These patients have been on medical treatment for peptic ulcer for a period of one year or more. All have had from two to four x-ray examinations showing complete disappearance of any evidence of ulcer. This is not to be wondered at because fifteen per cent of all cases of peptic ulcer have an associated gall-bladder infection. The important significance is the fact of the occurrence of gastric symptoms after the completion of the medical regime, indicating the failure of medical treatment. Naturally all thought their old trouble was recurring.

After reviewing these studies, certain questions present themselves. Is gall-bladder disease really as frequent as it would seem? Postmortem statistics show that eight per cent of adults who pass the fourth decade of life have gall-stones. More recent postmortem statistics show that twelve to twenty-five per cent of males who have passed the fourth decade of life, and twenty-four to fifty per cent of females who pass the fourth decade, have positive evidence of chronic cholecystitis.

So far, eleven of these patients examined have come to operation. Of these eleven cases, two had negative radiological findings, but at operation were found to have small contracted gall-bladders. Microscopic study, as well as clinical improvement, has proven that these gall-bladders were pathologic. Of the remaining nine all had definite clinically and radiologically diseased gall-bladders, and in addition one had carcinoma of the stomach. At operation one of the diseased gall-bladders proved to be primary carcinoma of the gall-bladder. The remaining eight had definitely diseased gall-bladders verified by microscopic section. Of these eight, two had gall-stones. In one of these the stones were demonstrated by the x-ray. In the other, the gastro-intestinal x-ray was negative. Repeated with the dye, it showed enlarged gall-bladder which failed to empty in normal time. The gall-bladder contained fifty-six stones. Clinical recovery has been very marked in all cases except one. This was a man aged fifty. He gave history of stomach trouble for thirty years, accompanied by migraine headaches. There was no tenderness over the gall-bladder. He had never been jaundiced; complained of some pain in left upper quadrant just lateral to the umbilicus. Repeated x-ray examinations of patient were all negative. This patient has a gastric achylia. X-ray with dye showed the gall-bladder almost as large as the palm of the hand. Operation revealed the large gall-bladder accompanied by more or less hepatitis and pancreatitis. Time will show improvement.

In reviewing the literature, the above cholecystographic observations represent about the general concensus of opinion of present investigators. Some authorities are claiming accuracy as high as ninety-seven per cent, and even Judd is unable to refute this at the present time. In 753 cases coming to operation last year at the Mayo Clinic, the radiological evidence was correct in seventy-six per cent. Previous to this method, Carmen stated that positive evidence was found in about fifteen per cent.

Now a very vital question presents itself. Why doesn't surgical treatment result in a higher percentage of cures? When the element of pain is present, the percentage reaches about ninety-five per cent. But on the average the best statistics run from sixty to seventy per cent. Of the remaining, some are partially relieved, and some not at all. The answer to this question will probably be found in considering the etiology and duration of the disease. A San Francisco surgeon recently reported the average duration of 100 cases coming to operation to be twenty years. Anatomical barriers are destroyed by the lymphatic system. The lymphatics of the gall-bladder extend more than an inch over the surface of the liver, and then connect with many adjoining lymphatics. It is quite apparent that an infection in the gall-bladder for twenty years will most assuredly produce structural changes in adjoining organs. Therefore the term cholecystic disease is not a good one, because the disease is often more extensive than the name implies. The inference from these facts is that the diagnosis will have to be made and surgery performed earlier. Now that we have the means of arriving at an earlier diagnosis, the next thing is to impress the patient with the necessity of earlier operation. Now, in this series of nearly seventy cases of quite definite gall-bladder disease, only eleven, or one in seven, have, as yet, submitted to operation. Many of these are not sick enough to submit to operation. They want to wait until they are compelled to submit. They do not have pain. That is the symptom to which the great majority will yield, and the only one. A large number of these patients have passed the age of fifty, and it is not advisable to urge operation. The mortality increases too much after this age. Gall-bladder cases should approach the operating table before this age. With the old adage, "Seeing is believing," fulfilled, and it is fulfilled, because we can actually see the diseased gall-bladder,—and as yet the sense of sight is the one and only sense by which either physician or layman is convinced of existing pathology,—we should be enabled to bring these patients to the operating table much earlier, and thereby eliminate morbidity, as well as mortality.

The etiology of gall-bladder disease reveals a number of confusing facts. Mann's investigations showed that certain hypochlorites have a chemical affinity for the gall-bladder. Without infection they produce chemical inflammation and round-cell infiltration, similar to that brought about by toxins, which develop within a brief period of minutes after intravenous injection. Repeated injections at intervals cause marked destruction of the gall-bladder mucosa and structural changes in its walls. In accordance with this work, Judd has made cultures from the contents and the walls of 100 gall-bladders removed at operation and has obtained positive cultures in only twenty-three per cent. Richet has found positive cultures in fifty-one per cent of 408 cases.

In spite of these observations, however, the role of infection is the most generally accepted one. In his work on selective localization of bacteria, Rosenow has demonstrated that strains of gall-bladder organisms, when injected into laboratory animals, localized in the gall-bladder in eighty per cent of cases. And twenty-nine per cent of these produce lesions in the stomach or duodenum. Also gall-bladder lesions were produced in twenty-one per cent of animals receiving stomach or duodenal strains. Although Graham has proved that the gall-bladder infection usually results from lymphangitis, not only of the liver but also of the pancreas, most investigators believe the reverse to be true. Meyer, at the Hooper Foundation, has shown that the gall-bladder shares with the liver the functions of removing bacteria from the blood stream. Sherrington claims that damage to the hepatic cell is preliminary to the appearance of bacteria in the bile. The health of the hepatic cell depends upon its blood supply from the hepatic artery. Therefore the health of the arterial blood stream seems all important and such conditions as typhoid fever, tonsillitis, sinusitis, empyema, purulent appendicitis and other severe infections, must be considered, when they antedate the gall-bladder disturbance. It has been estimated recently that eighty per cent of gall-bladder disease occurs in women who have been pregnant and eighty per cent of these give a history of their first attack dating from, or soon after, a pregnancy. While very little is

known as yet regarding impaired hepatic function, nevertheless it probably is interfered with more or less during pregnancy.

In summarizing these observations certain facts have become evident.

1. The balance of proof has shown that the gall-bladder is the starting point of cholecystic disease and, while cholecystectomy does not result in 100 per cent of cures, it seldom, if ever, fails to check the progress of the disturbance, i. e., some patients may not recover but they never become worse.

2. The presence of gall-bladder infection cannot always be diagnosed by palpation and inspection after the abdomen has been opened. Certain findings, as hepatitis and pancreatitis, are very conclusive. Even adhesions, or the enlargement of the lymph glands around the gall-bladder, are sufficient evidence for doing a cholecystectomy. But it has been recognized for a number of years, by many surgeons, that the diagnosis and surgical treatment of gall-bladder disease, in many cases, is based upon clinical diagnosis reached by study and exclusion before the abdomen has been opened. If the careful diagnostician says the gall-bladder should be removed, the surgeon must seriously consider his responsibility in saying that the gall-bladder appears normal. A common occurrence has been for the surgeon to explore the gall-bladder, and, finding it apparently normal, and discovering no other pathologic lesions in the belly, to remove a chronic appendix. Instead of lessening the probability of a cholecystitis, the very presence of a chronic appendix speaks for gall-bladder disease, because of their frequent association. In fact this is estimated to be the condition in forty per cent of cases.

3. A gall-bladder, once opened and drained, never functions again. So far we have been unable to outline with the dye a gall-bladder in which a cholecystostomy has previously been performed. This will forever refute one of the main arguments for cholecystostomy instead of cholecystectomy. This fact will increase the beneficial results of surgical treatment. It is estimated that eighty per cent of those who are not relieved surgically have had cholecystostomy instead of cholecystectomy performed.

The one and only legitimate reason for leaving a gall-bladder in the abdomen, with the exception of when the risk is too great, is for the possible necessity of a future cholecystoduodenostomy. Two or four weeks of cholecystostomy drainage through the abdominal wall, is not sufficient to improve a chronic pancreatitis. Relief of biliary stasis through the normal channel into the intestines must accomplish this. The next important step after the removal of the causative factor, which is the gall-bladder, is the relaxation of the sphincter of Oddi, which is the sphincter at the opening of the common duct into the intestine. Cholecystectomy relaxes this sphincter while cholecystostomy does not. If the presence of adhesions is sufficient evidence for the removal of the gall-bladder, why should a gall-bladder be drained when, without exception, this results in the densest adhesions to the abdominal wall? And its very presence is a constant source of impending trouble. I recall a case which came to operation about two weeks ago. A large portly woman, weighing over 200 pounds, had repeated gall-bladder attacks. At operation there was an enlarged gall-bladder but no stones. On account of her excessive weight she was not considered a good risk, so a cholecystostomy was performed, resulting in temporary relief for about two months. The sinus never closed; symptoms became worse. The abdomen was opened one year later and a stone the size of a hen's egg was removed along with the gall-bladder.

Such a case might often explain what is commonly termed "the overlooked stone in the common duct." If a stone will form in the gall-bladder in this period of time, might it not be possible for a stone to form in the common duct after operation, especially if biliary drainage is not sufficient, and stasis is still present as the result of an unrelaxed sphincter of Oddi, or a cholangitis?

The question of biliary stasis brings up the question of the function of the gall-bladder and methods of emptying the gall-bladder. It has been proved with the aid of cholecystography that animal fat will cause a gall-bladder to contract and empty, when magnesium sulphate solution, introduced into the duodenum through the duodenal tubes, fails. If this is really borne out, why give patients all sorts of cholagogues and submit them to prolonged drainage procedures with the duodenal tube, when drinking a glass of cream will produce the same effect with a much greater degree of certainty?

4. The gall-bladder has a function, which is the concentration of the bile. But apparently it is not a very important function because, as yet, no one has shown any untoward results from depriving the sys-

tem of this function by the removal of the gall-bladder. No doubt the liver assumes this function, because, in certain lower animals which have no gall-bladder, the bile is secreted more concentrated than in other animals which have one. And it has been proved by cholecystography that the function of the gall-bladder is interfered with in direct proportion to the extent of the pathology present. We do not hesitate any more to remove a diseased tonsil. In fact, any one who argues otherwise is viewed with no small amount of pity. It seems rational, then, to apply the same consideration to a diseased gall-bladder. And no doubt the average patient will fare much better without any gall-bladder than with a diseased one.

X-RAY EXAMINATION OF THE GALL-BLADDER

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In the development of diagnostic x-ray technic, as applied to the abdomen, the gall-bladder has long been the bete noir of the radiologist. The clinical and pathologic evidence that the gall-bladder is involved much more frequently than we have thought, has accumulated year by year until eminent clinicians do not now hesitate to state that chronic cholecystitis is the most frequent cause of chronic indigestion. When the appendix has been suspected, the radiologist has usually been able to prove, by barium meal and enema, whether or not this suspicion was correct. With the gall-bladder suspected, the most careful attention to technical refinements all too frequently left the diagnosis in doubt.

The work of George, of Boston, and those who accepted his criteria, has until recently, been the best we could do. By almost hair-splitting attention to technic, we could frequently outline the gall-bladder and arrive at an opinion as to whether it was too dense or not. Over-refinement of technic brought confusion, however, and when the Bucky diaphragm came into use it was not at all difficult to outline the normal gall-bladder, and we no longer were able to say that a visible gall-bladder shadow meant a chronically diseased organ.

Falling back, then, on indirect signs, we have run the gamut of duodenal hyper-motility, spasm of the stomach, regurgitation into the esophagus, displacement of the cap, indentation of the pylorus or cap, adhesion deformities, displacement of stomach to left, palpable tenderness, etc. All of these are useful, and have enhanced our ability to arrive, indirectly, at conclusions about the presence or absence of gall-bladder disease. Always, however, there has been something incomplete about gall-blad-

Fig. 1. Left, shows gall-bladder outlined fourteen hours after ingestion of dye; center, shows normal duodenal cap and its relation to gall-bladder; right, shows gall-bladder still well outlined at thirty-six hours. Chronic cholecystitis.

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der examination. When looking at a barium filled stomach, we have come to depend on visible functional activity as well as on filling defects. Hyper or hypo motility, spasms of the pylorus or stomach wall, presence or absence of peristalsis, etc., have allowed us to judge of functional interference and thereby to estimate the presence or absence of disease. With the gall-bladder, unless stones were shown, we have been able to see nothing directly, and have always felt the lack of a knowledge of the functional capacity of the gall-bladder. Therefore, radiologic methods have been supplemented by duodenal drainage, and other methods of determining gall-bladder function.

When Graham and Cole announced their work on visualizing the gall-bladder by dyes containing bromine or iodine, injected into the blood and later given by mouth, the announcement received an enthusiastic welcome. Visualization of the gall-bladder —with the consequent ability to judge of its position, size, shape, and relation to contiguous viscera, to observe its capacity to empty, the contractility of its walls, and its behavior over any desired period of time—gave us an accurate method of determining anatomical changes, and, of far more value, of determining functional capacity.

The difference which this has meant to radiologists is attested by every paper on

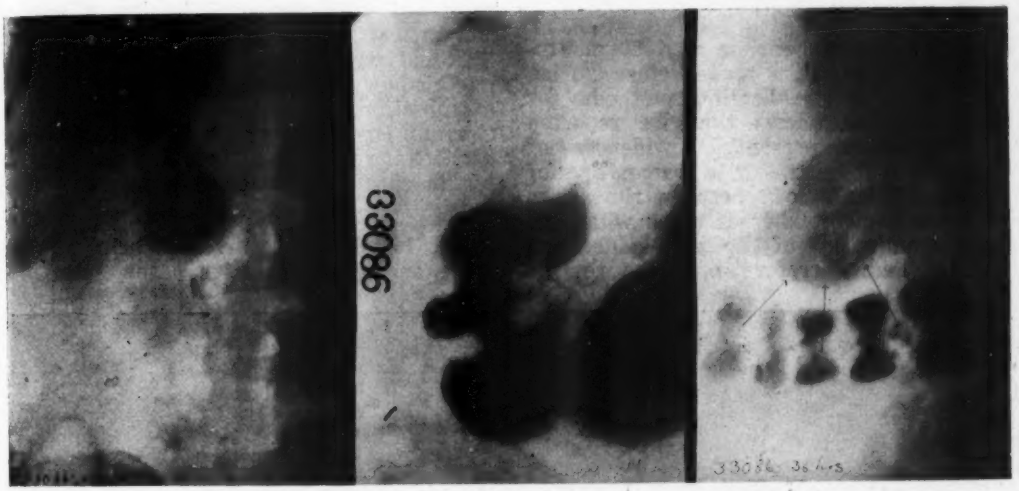

Fig. 2. Left, gall-bladder fourteen hours after dye, showing irregularity in contour; center shows displacement of duodenal cap and pressure deformity from gall-bladder; right, shows gall-bladder at thirty-six hours after dye, irregular in shape. Chronic cholecystitis.

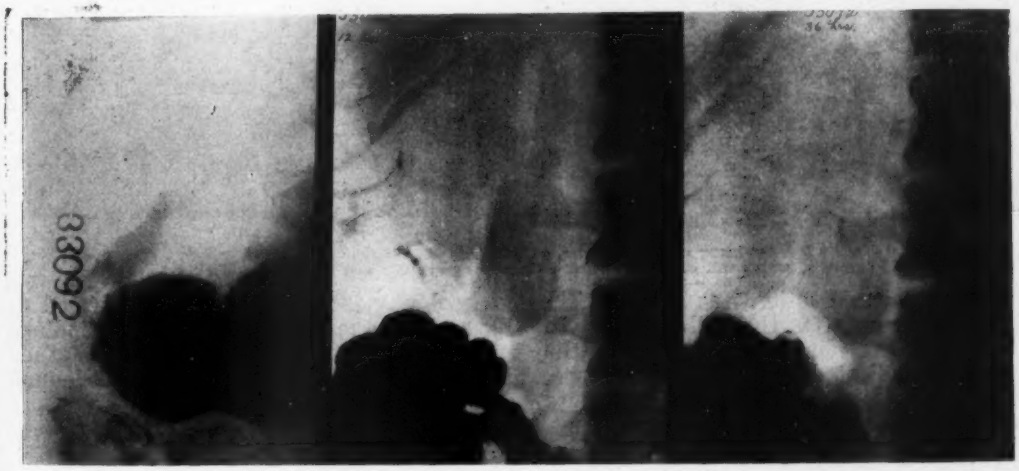

Fig. 3. Stomach with barium meal, showing evidence of pressure deformity of cap; center, gall bladder fourteen hours after dye; right, gall-bladder thirty-six hours after dye, showing inability to empty. Chronic cholecystitis.

the subject, and no medical meeting of consequence today is complete without some mention of this method. Our own experience has been similar to that of radiologists the country over, and we are no longer willing to undertake the examination of a patient for gall-bladder disease without permission to use the dye, if manifest gall-bladder pathology is not shown in a preliminary examination.

A rather cursory review of 4000 gastro-intestinal examinations made before we began using the visualization methods for the gall-bladder, shows that we reported the gall-bladder presenting evidences of disease in 626 cases, or a percentage of thirteen. This is low, because the series includes a large number of cases where no special examination of the gall-bladder was requested and, therefore, only the routine barium meal examination was made, without special technic for the gall-bladder. In 1150 cases, the clinician stated that the symptoms indicated gall-bladder disease, and in such cases the x-ray findings were positive in more than fifty-five per cent. This is still too low, but was the best we could do up to the time of the recent technic. Of the 626 cases, eighty showed gall-stones. It is well known that gall-stones fail to show in at least half the cases, even when the evidence of pathological gall-bladder is conclusive.

Since the institution of visualization methods, up to May first, we had examined 204 patients by this technic, using it only on those patients whose symptoms brought the gall-bladder into question. Of these, the evidence was conclusive for pathological gall-bladder in 123, and conclusive for normal gall-bladder in 49, giving positive findings one way or the other in over 84 per cent of the cases. There were 32 cases in which the findings were not conclusive. These include those patients who did not absorb the dye, who vomited the dye after ingestion, whose gall-bladder outline was faint but with normal behavior otherwise, and patients whose gall-bladders did not outline and who had no indirect evidence of gall-bladder disease. It is likely that re-examination in many of these cases would clear up the findings; several patients have been examined twice, almost always resulting in conclusive positive or negative findings.

We have not secured reports on any large series of operative cases, but, in a general way, our surgeons have learned to have the same confidence in the findings with regard to the gall-bladder as they have in the case of stomach or duodenum.

Fig. 4. Left, gall-bladder fourteen hours after dye; center, gall bladder still plainly visible thirty-six hours after dye; right, irregularly outlined appendix, with small concretion defects. Chronic cholecystitis and chronic appendicitis.

We used the intravenous technic on a few cases in the beginning, but this was soon given up for the ingestion method. We have used tetraiodophenolphthalein by mouth in coated and uncoated capsules, and combined with soda, in coated pills, after meals, during meals, and without meals.

It is the usual suggestion that the dye be given in capsules coated with some substance insoluble in the stomach, so that the dye will be shunted into the duodenum before the capsules dissolve. Two prominent radiologists use plain uncoated capsules, one giving them at short intervals after

the evening meal, and the other giving them during the evening meal; both are entirely satisfied with their results. Some workers are using the dye intravenously in office practice; others are using it intravenously but only in hospitals. Every possible technic is being tried, and out of this confusion will come a standard method, just as the technic of stomach examination has finally become uniform.

The matter of technic is not the important thing for the clinician who refers work to a radiologist, or who does his own work. The important thing to remember is that a study is being made of gall-bladder FUNCTION, and that the visualization of the gall-bladder has not simplified this study but has complicated it. It has given us a means to make a more thorough and detailed study, but that study still must be thorough and exhaustive, if we are to avoid mistakes. The addition of the visualization technic has made the gastro-intestinal examination just about fifty per cent more time-consuming than it was before. The reward is not in having an easy road to the diagnosis of gall-bladder pathology, but in having any road at all. We have the road, but it must be negotiated with care and fine attention to the diagnostic points.

We have practically stopped making a preliminary examination of the gall-bladder, since this requires an extra day, and both patient and referring physician resent this. If the gall-bladder is in question, therefore, we have the patient take the regular evening meal; formerly we placed no restrictions on this, but of late we are excluding meats and fatty foods from this meal. Either during the meal, or starting about two hours after the meal, the patient swallows the capsules, each containing .5 gm. of the dye (tetraiodophenolpthalein), taking from eight to twelve of the capsules at short intervals. He drinks a glass or two of water and lies on the right side until bedtime. He comes to the laboratory the following morning, twelve to fifteen hours after taking the capsules, without breakfast. There films are made of the abdomen and gall-bladder area, and barium meal given. We regard the barium meal examination just as essential as it ever has been in gall-bladder examination. With the gall-bladder visualized, frequently plainly seen on the screen, we can determine its relation to the duodenum and pylorus, whether it presses upon these structures, whether it is adherent, its position and whether it is fixed or mobile. We may then follow either one of two courses. If the stomach and duodenum appear normal and time is an element, we allow the patient to have a lunch containing an excess of fat, and radiograph the gall-bladder two hours after lunch, to ascertain whether the fatty meal has caused the gall-bladder to empty. If it has, and there was no other indirect evidence of disease, we conclude that the gall-bladder is normal. If we still have the stomach or duodenum in question, the patient continues without food and we make the regular six-hour barium meal observation, which will be an eighteen or twenty hour

Fig. 5. Right, densities in gall-bladder area, resembling stones. Left, gall-bladder outlined with dye, showing stones lying close against pyloric shadow of barium filled stomach. Cholelithiasis.

period for the gall-bladder. If we find the gall-bladder has contracted in size and become denser, or has emptied entirely, we conclude that it is probably normal. However, it is again examined the following morning, which is thirty-six hours after dye ingestion. A visible gall-bladder density at this period is pathological and means inability of the gall-bladder to empty. If the shadow is gone at this period, we conclude either that the findings are normal, or, if other signs have been suggestive, we record inconclusive findings, and either repeat the examination with some variations in technic, or review the whole findings with the clinician and endeavor to harmonize radiologic and clinical data into a diagnosis.

It will be obvious immediately that the most perfectly visualized gall-bladder will be the normal one, where the dye is completely absorbed, eliminated promptly into the bile and collected into the gall-bladder. It is also obvious that interference with the excretion of the dye into the gall-bladder will result in an imperfectly outlined viscus, or no shadow at all. Conversely, the failure to outline the gall-bladder, will mean that something has interfered with the normal entrance of dye impregnated bile into the bladder. This may be one of three conditions: (a) liver disease, where the dye does not get through into the bile; (b) obstruction of the cystic duct, with the bile passing into the bowel along the common duct; (c) gall-bladder disease, where the bladder is already filled with inspissated bile, stones, pus, mucus, watery fluid, or some other abnormal contents, and the dye which is excreted does not enter and outline the bladder. The presence of liver disesae is either apparent or determinable by other means; obstruction of the common duct may often be inferred by other evidence, such as adhesions, stone shadow, or manifest disease in this area. The presence of gall-bladder contents which will not completely empty because of disease of the walls of the organ is one of the conditions which this method determines most readily, and since it is the most common gall-bladder lesion, the method finds its chief value here. If we find the dye absorbed from the intestinal tract, and the gall-bladder faintly outlined, either large or small, and particularly if this faint outline persists, we may be reasonably certain that there is disease of the gall-bladder. I have not yet seen a single case in which this finding was present and was operated upon, that the gall-bladder was not grossly diseased.

Where the dye is not absorbed from the tract, because of some condition either in the capsules or in the intestine or stomach, the findings become uncertain. Often enough dye is absorbed to permit the examination to proceed to positive conclusions. Sometimes no conclusions can be drawn. We have seen the capsules remain in the stomach, and unbroken, twelve hours after ingestion.

DISCUSSION

DR. H. A. INGALLS, Roswell, New Mexico (opening): Gall-bladder infections are rarely primary, but usually secondary to infections elsewhere in the economy. In the vast majority of cases the symptoms are slight and obscure until marked gross changes have taken place.

Our president, in his address yesterday, stressed the lowered resistance of the present generation, making necessary the use of prophylactic sera and vaccines. Tonsils and teeth have lowered vitality and furnish the vast majority of our foci of infection, with numerous secondaries in other organs and tissues.

Reed, as the result of his investigations, proved that many of the inmates of our institutions for the insane were mentally abnormal, not from degenerative changes in the cerebro-spinal system, but because of incoordination of mental faculties due to toxemia, and that these individuals could be returned to normal activity by removal of the various foci of infection. As an infected gall bladder may cause as much damage as a focus elsewhere, the timely warning of the essayist should be heeded.

Our good friends and intelligent co-workers of the laboratories must be called to our assistance, as, with visualization of the gall-bladder, the cerebro-spinal system, the gastro-intestinal and the genito-urinary tracts, together with blood chemistry, we are now in position to offer early relief in all of these cases.

The American Medical Association, in advocating the routine examination of the apparently normal, has made quite a stride in the right direction and, if this is accepted by the pubilc, it will not be necessary for Doctor Milloy to tell us that the condition, when patient first reported for examination, has existed for a period of from fifteen to twenty years.

DR. M. F. SMITH, Raton, N. M.: I should like to call your attention to a phase of gall-bladder symptomatology following childbirth or other pelvic focus as a miscarriage or surgical procedure. It seems that women having a tendency to gall-bladder disease show an exacerbation following such an event. This is made manifest by pain and digestive disturbances. This symptom complex may last for a year following childbirth, and gradually subside. I believe it is, partly, at least, due to infection from the pelvis.

Dr. Milloy stated in his paper that cholecystectomy was less liable to be followed by pain than cholecystostomy. My experience has been that there may be pain following either operation, due, perhaps, to adhesions or the reformation of calculi somewhere in the ducts, which may even follow cholecystectomy. The removal of the gall-bladder has, in my opinion, a higher mortality than the drainage, this especially in the difficult case or in the hands of the occasional operator.

Further, the technic of finding your anatomy after a cholecystectomy will try the patience and skill of a master surgeon. That gall stones can

form in the common duct and require this subsequent interference, is well known. Adhesions distorting the common duct will often cause serious and painful symptoms. When the gall-bladder is removed it takes away the support to the common duct and, with the adhesions, may produce a stricture.

I should like to have Dr. Milloy criticize further the above questions which still sway my determination in the matter of choice between cholecystectomy and cholecystostomy. He has brought his thought to us in a convincing manner and I must express my appreciation of the paper he has just read. I believe this covers my discussion.

DR. CHARLES M. SIMPSON, Temple, Texas (opening): As a urologist, I wish to draw attention to the frequency with which lesions of the gall-bladder and kidney may be confused, and the bearing that x-ray examination may have upon the diagnosis. To illustrate, there recently came to Scott & White Clinic a woman fifty-nine years of age, who presented only one major symptom, a single attack of sharp severe pain in the right thigh extending downward from hip to knee. Soon afterward, she noticed a tumor mass in the right abdomen. She had no jaundice, but had been running some temperature. Physical examination revealed a movable mass in the abdomen, well back toward the kidney region. Urine examination showed a trace of albumin and a mass of pus cells. We were inclined to believe the mass to be an enlarged kidney. Cystoscopy was done and a pyelogram made. The urine on the right showed considerable pus but the pyelogram was essentially normal. A cholecystogram was attempted, and the gall bladder failed to fill, thus indicating a possible involvement of the gall bladder. All other examinations were essentially negative. After a repeated cystoscopy to check up again on the kidney function, it was decided that the tumor was probably a gall bladder. Right rectus incision revealed an enormously distended gall-bladder with stones in the cystic duct. The gall-bladder was about six inches long, and about two and a half inches in diameter, and filled with a clear watery fluid. I mention this case to illustrate the difficulty sometimes encountered in making a differential diagnosis and the value of the various diagnostic methods which are here under discussion.

DR. FRANK J. MILLOY, Phoenix, Ariz., (closing): It is probably a very good routine preparation to have all patients cystoscoped before a major abdominal operation, and especially the gall-bladder patient. Being associated with a urologist, I have been convinced that a great many deaths after major operations are due to kidney complications. If the major operative case is to recover from the attending shock of operation, it is very evident that the kidneys must function. The common urological conditions which are remedied by cystoscopic examination do interfere with the normal function, and especially after a major operation. The mortality is not only reduced by this procedure, but the regular convalescent period is often much shortened. In regard to age: shortly before he died, Dr. Ochsner published a paper in which he stated that it was his opinion that the primary infection in most gall-bladder cases occurred around the age of twenty. In fact, he said that he could trace a history in a majority of cases back that far. This means that the young adult who suffers an attack of catarrhal jaundice or recurrent spells of so-called biliousness will probably present the usual picture of cholecystitis in later years. This inference seems quite probable because investigators have shown that organisms found in tonsils very often produce gall-bladder lesions when injected into laboratory animals, and it is at this age that the tonsils give most trouble, because after this age they tend to atrophy.

In reply to Doctor Smith's remarks about pain, cholecystectomy does relieve pain in ninety-five per cent or more cases. Where pain is not a factor in the clinical picture the results are not so striking. This is because the infection has spread beyond the borders of the gall-bladder. The more we delve into the history of gall-bladder cases in women the more convinced we are that eighty per cent of women who have gall-bladder disease have been pregnant, and the first symptoms of their trouble date from a period either during pregnancy or shortly after delivery.

In regard to mortality, I do not think that it is so high following gall-bladder operation as we have been led to believe. Our text books tell us that it usually runs about two per cent in cholecystostomy and five per cent in cholecystectomy. If some attention is paid to pre-operative preparation and post-operative care, these statistics are certainly much too high. In fact, some recent statistics have shown a greater mortality in cholecystostomy than in cholecystectomy. But this is due to the fact that, in a great many cases where a cholecystostomy is done, the condition is an emergency, and such patients are in critical condition when they come to the operating room. We are probably justified in giving all patients digitalis who have passed the age of thirty-five before they are operated upon, whether they present any signs of cardiac disease or not. Previous to this age it is probably not necessary. Cholecystography has not solved the question of gall-bladder diagnosis as yet, but it certainly offers the most valuable positive diagnostic evidence at our command.

Doctor Watkins and I have tried to work out this question of capsules together, and it seems that the kind of capsules used has nothing to do with the vomiting. It was supposed at first that the vomiting was due to the capsules dissolving in the stomach. In two cases of obstructive ulcer in which the capsules were given, they remained in the stomach during the entire thirty-six hours of observation, and how much longer I do not know, and at no time were they dissolved, and neither did either of these patients vomit. It would seem that if the capsules would dissolve in any stomach they would certainly dissolve in a stomach in which a pyloric obstruction and a high gastric acidity were present. In two of our cases who vomited the capsules, we dissolved the capsules in water and gave them through the duodenal tube. Both of these patients vomited the second time, and both vomited some of the dye. The fact that some of the patients vomit who receive the dye intravenously, probably means that the dye has a toxic effect upon these patients, and the result is a reverse peristalsis extending far beyond the stomach into the intestines.

In answer to the Doctor's question about jaundice in young people: jaundice means infection in the biliary system, and especially in the common and cystic bile ducts. It is pretty well agreed at the present time that, if the gall-bladder or bile ducts once become infected, the gall-bladder probably never rids itself of this infection, so that if these cases of catarrhal jaundice in young people could be traced through to their later life the majority of them will probably have symptoms of chronic cholecystitis. A history of jaundice in any case of chronic dyspepsia is almost conclusive evidence of an existing cholecystitis.

DR. W. WARNER WATKINS (closing): I wish to repeat a statement which I have to make about twice a year. That is, that we do not consider our x-ray examinations as being complete in themselves. We do all our work as a part of the clinical examination, and it should be done that way. We prefer to receive a case after the clinician has worked it out up to the point where there is a question which can probably be settled by an x-ray examination. Then, with the patient submitted to us for the working out of a definite problem, we can usually give information of value.

In gall-bladder work, when the clinician arrives at the point where the answers to certain questions will tell him whether or not he is dealing with gall-bladder disease, and those answers can be supplied by the x-ray examination, we can then work satisfactorily with the clinician. In the technic described, we can more nearly arrive at an idea about the functional ability of the gall-bladder than by any other method; it is more accurate than inspection through laparotomy incision. If we can tell the clinician or surgeon that the gall-bladder is filled with contents which it is unable to empty out, that it lacks muscular contractility and is unable to condense its contents, we have given information which the clinician can fit into the clinical picture. Do not forget that the value of this method of examination lies in the information which it gives regarding functional ability rather than pathological changes. For that reason the surgical inspection with the abdomen open will sometimes be at variance with the x-ray findings, and the x-ray indications may be correct.

CHRONIC PROSTATITIS

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In recent years, medical research has shown that many hitherto unexplained pathological phenomena are due to infections in various parts of the body. The tonsils, teeth and sinuses have been proven to be offenders. From the reports of urologists it would seem that prostatic infection is well worthy of study in connection with obscure symptoms of various kinds.

ANATOMY

The prostate gland is a pale, firm, partly glandular, partly muscular, body, situated immediately below the neck of the bladder and around the commencement of the urethra. It is placed in the pelvic cavity, behind the lower part of the symphysis pubis and above the deep layer of the triangular ligament, resting upon the rectum, through which it may be felt, especially if enlarged. In shape and size it resembles a chestnut. The blood supply comes from the internal pudic, vesical and hemorrhoidal arteries, the nerves from the pelvic plexus. (Gray's Anatomy.)

PHYSIOLOGY

The gland consists of from thirty to fifty lobules with fifteen to thirty ducts opening near the orifice of the ejaculatory duct. Prostatic secretion is thin, cloudy, slightly alkaline and contains albumin but no mucin. At the moment of ejaculation, the gland contracts rhythmically, and its secretion is mixed with the thicker seminal discharge. The prostate also secretes an endocrine which is absorbed into the body.

ETIOLOGY

Chronic prostatitis may be divided into two principal classes, viz.: those in which there is no infection, and those following gonorrheal urethritis. In these days of rigid asepsis, it is rare to encounter prostatitis resulting from the use of unclean instruments or trauma.

The first class comprises those cases arising from sexual excess, masturbation, ungratified sexual desire aud over-indulgence in alcohol. "Necking" and "petting" parties contribute their share of the so-called "aseptic" type of prostatitis. Long motor trips over rough roads may set up a non-infectious prostatitis, due to great increase in the pelvic blood supply, amounting to congestion.

While the disease may occur as the result of acute gonococcus infection of the gland, by far the greater number of chronic prostatitides arise as such.

PATHOLOGY

In the aseptic form, there is swelling of the mouths of the ducts, with over secretion of the follicles, evidenced by the appearance of a drop of secretion at the meatus or a haziness of the urine due to the dropping back of the prostatic fluid into the bladder.

After the gonococcus has established itself in the posterior urethra, it gradually loses its vitality. After a varying period, with a maximum of from one to four years, according to different authorities, it disappears. Its place is taken by other bacteria, such as the staphylococcus, streptococcus, bacillus coli, pneumococcus, etc., the first named being found in the greatest number of cases.

To illustrate, the following case is quoted.

Male, 37, white, American, married, was referred by Dr. John A. Hardy. He complained of a discharge from the meatus. Two weeks before

(Read before the El Paso County Medical Society).

the appearance of the flow, he noticed a slight itching of the urethra near the meatus, which lasted three or four days. He indulged in alcoholic refreshments and the following morning the discharge appeared. He gave a history of gonorrhea 12 years before, complicated by a double epididymitis.

On examination, the prostate was found to be enlarged and boggy, with areas of induration along the lateral margins. The right vesicle was palpable, but not painful. Smears taken did not show gonococci, but a culture of the urine gave a growth of B. coli.

When the Neisserian infection invades the posterior urethra, it is only a question of a short time when the mouths of the prostatic follicles are infected. The invasion of the ducts may be as far as the disease progresses. This is known as catarrhal prostatitis. There is increased growth and shedding of the epithelium of the ducts. After massage, the urine contains the so-called "prostatic plugs," composed of pus cells and epithelial debris.

In the follicular form, the body of the gland is invaded, and there is a concurrent peri-folliculitis, evidenced by round cell infiltration about the follicles. As this resolves, scar tissue is formed with sclerotic obstruction of the follicles and their final obliteration.

In rare cases, the process goes on to suppuration, the abscess destroying the glandular tissue. Unless opened surgically, it usually opens into the urethra, but sometimes perforates the perineum.

SYMPTOMS

The symptoms of the "aseptic" type of prostatitis are discharge from the meatus, backache, sometimes slight discomfort in the perineum, premature ejaculation. The discharge is thin, milky, and is not irritating.

In the infectious form, the symptom oftenest complained of is the morning drop at the meatus. This usually contains pus, and may or may not contain gonococci. A typical history of one of these cases is that the patient had had a gonorrhea some months or years before. A few days before his appearance, he had indulged in alcoholic beverages, or had had excessive sexual intercourse, or both. Two or three days later, he awakened to find a large drop of pus in meatus. The excesses of early married life are often responsible for the recrudescence of symptoms in a young man who confidently believed himself rid of his Neisserian infection.

Frequency of urination is a very annoying symptom in a large proportion of cases. It may be accompanied by burning and urgency. In some cases, there may be actual pain at the termination of micturition, followed by a few drops of blood as the sphincter closes on the engorged mucous membrane. The swelling of the gland may reach such proportions as to seriously interfere with urination, even to the point of total inhibition, necessitating the use of a catheter for relief. Prolonged inflammation, leading to the formation of scar tissue, with subsequent contraction, may lead to a pronounced narrowing of the vesical neck.

Various pains and aches of reflex origin are often complained of. The commonest and most frequent is lumbo-sacral backache. It is dull and heavy in character and is unrelieved by rest, posture or exercise. It is usually bilateral, although it may be confined to one side. Pain in the groins, radiating into the testes, discomfort and pain in the perineum and rectum are occasionally found.

Male, 26, white, American, married, was referred by Dr. R. B. Homan complaining of the following symptoms: dull aching pain in the groins, extending into both testes, around crotch and into rectum; dull aching pain over sacrum; digestive disturbance for five years past, manifested by chronic constipation, hyperacidity and pain through right side from liver to the back. He denied venereal disease; is under treatment for pulmonary tuberculosis.

The prostate was boggy and moderately enlarged. First urine was clear, second urine, after massage, was turbid. Pains complained of were relieved by prostatic massage. Culture of urine (second) gave growth of staphylococcus.

Another case occurring in a man of 43 years of age presents the following data: Occipital headache; backache; frequent urination at times; pain in left hip joint. Examination revealed a boggy prostate with left seminal vesiculitis.

The engorgement of the prostate, posterior urethra and verumontanum is responsible for certain symptoms of a sexual nature. The first one noticed by the patient is usually premature ejaculation. This may or may not be accompanied by a disagreeable sensation in the perineum after ejaculation. With the stimulation of a congested prostate, the patient feels that his sexual powers are increased, the desire and ability to perform are more than before. Later, he notices that his secretions are faulty, sensation is less pleasurable, and finally he is unable to copulate. In most cases, the mental impression produced is very depressing to the patient. If his symptoms are not relieved, he becomes that bugbear of the urologist, the sexual neurasthenic.

Absorptions of toxins from a chronically infected prostate sometimes produces con-

stitutional symptoms, evidenced by general malaise, lack of appetite, slight rise in temperature, etc.

CASE. Male, 35, white, American, single, complained of backache, feverish feelings, general malaise and lack of appetite. There was no discharge from the meatus and only a few strings in the first urine. The prostate was large and indurated. Second urine, after massage, was cloudy. Appropriate treatment rapidly cleared up the symptoms.

In some cases a chronically infected prostate seems to have a direct connection with disorders of the intestinal tract. I have had two cases in which massage and treatment of the prostate promptly relieved intestinal intoxication with its train of constitutional symptoms.

DIAGNOSIS

Practically every patient consulting a physician for treatment of a urethral discharge thinks first that he has contracted a gonorrhea. The man who has had a gonorrhea is certain that it has returned.

Every physician who treats venereal disease should have a certain routine examination in every case. This examination can be amplified if necessary. In the treatment of chronic prostatitis the procedure should be along the following lines:

1. If a discharge is present take a smear.

2. Examine external genitalia, noting size of meatus, anatomical deformities, balanitis, varicocele, hydrocele, induration of epididymes, condition of inguinal glands, etc.

3. Have patient void part of the urine in a glass, noting clarity, presence or absence of pus threads.

4. Let patient bend over table and insert gloved finger, well lubricated, in anus. The resiliency of the sphincter should be noted. Examine prostate with regard to size, shape, mobility, presence or absence of pain, induration and bogginess. Examine vesicles.

5. Massage prostate and seminal vesicles gently, noting evidences of pain on part of patient.

6. Let him void balance of urine, making note of its clarity, etc.

7. Sounds or bougies should be passed to determine presence or absence of strictures. Massaging over sound will demonstrate presence of inflamed urethral glands. Irrigate urethra with boric solution and examine fluid for detritus expelled from glands.

8. Examine posterior urethra through a close vision, irrigating urethroscope, such as the McCarthy or Greenberg. This will give a close-up of the verumontanum, show the presence of cysts, false passages, etc., in the urethra, and the condition of the prostatic ducts. Through it medication can be applied to these structures.

TREATMENT

The first essential of successful treatment is to impress upon the patient that the cure of his ailment will require time and patience, and can be secured only by intelligent cooperation on his part. Anything that will serve to increase the pelvic congestion will have a deleterious effect on his conditoin. Sexual intercourse, indulgence in "necking and petting" parties, resulting in unsatisfied desire, long drives in motor cars, alcoholic excesses, etc., serve to nullify the success of treatment.

In the so-called "aseptic" type of prostatitis, massage of the prostate twice weekly, followed by the instillation of argyrol, neosilvol. and, in the later stages, nitrate of silver in gradually increasing strengths, gives excellent results.

In the infectious form, varieties of prostatic inflammation are met with—the large boggy prostate and the small indurated one, or a combination of the two. Frequently, a digital examination of the prostate shows marginal induration with central bogginess or a general bogginess with areas of induration throughout.

Prostatic massage, gently performed, twice weekly should be carried out until the indurated areas soften and the bogginess disappears. A Kollman dilator is then passed and gradually dilated to about 35 French scale. If pus and bacteria are present in the urethral and prostatic discharges, I inject mercurochrome or mercurophen suspended in a tragacanth jelly, the former in 2 per cent suspension and the latter in 1-5000.

If pus cells are absent, the injection of some of the silver salts is preferred, such as argyrol or neosilvol in 10 to 25 per cent solution. All these injections should be retained as long as possible.

Contramine, which is diethyl ammonium diethyl dithiocarbamate, gives good results in rebellious cases, particularly of the indurated type. It is injected intramuscularly in the buttocks. The dose is 0.25 cgm. dissolved in 3 c. c. of distilled water, twice weekly for six doses.

The intravenous injection of mercurochrome in the dosage of from 20 to 30 c. c. of a one per cent solution, gives excellent results in the infectious variety of pros-

tatitis where massage of the gland shows constant pus cells and bacteria.

Diathermy has been advocated in these cases. I have used it, but not in enough cases to form an opinion as to its curative properties. However, those cases in which I have used it, seemed to benefit from its use.

Repeated examinations of the discharge should be made to determine the presence or absence of the Neisserian infection. If this is absent and pus still is expressed from the gland, cultures should be made to find the offending organism.

Exacerbations, as evidenced by return of the discharge in more or less acute form, are usually due to alcoholic or sexual excesses or to the opening up of a concealed focus of infection.

Engorgement of the verumontanum is to be treated through the urethroscope by touching up the organ with solution of nitrate of silver, ten per cent. This should be repeated every five to seven days.

RESUME OF THE RECENT SCARLET FEVER LITERARTURE

(Not Including That of the Italian School)

DR. ORVILLE H. BROWN, ASSOCIATE EDITOR

The first unmistakable account of scar-

First detailed description was by Sydenham in 1675.

Credit for suspecting the cause to be streptococci goes to Marmorek and Schottmueller. As early as 1885 evidence pointed definitely to streptococci as the cause of scarlet fever.

First antitoxins were developed independently by Marmorek and Sarchenko in 1895.

Wiessberger in 1897 recommended convalescent serum.

Courmant in 1898 developed an antitoxin.

Moser and Von Piquet in 1902 developed an antitoxin which was beneficial.

Miss Tunnicliff of Chicago in 1902 definitely identified the streptococcus hemolyticus as the organism found in scarlet. She also proved that convalescents had antibodies in their blood for these bacteria. Gabretschewsky in 1907 protected persons by injections of killed cultures.

The antitoxins so far developed fell into disuse, even though they did good, because the dose was 100 to 200 c. c.

The filterable virus theory has been advanced again and again.

Riess and Jungmann in 1912 revived the use of convalescent serum.

Zingher in 1915 advised whole blood of convalescents or even of normal persons.

E. C. Rosemew in 1918 developed an antitoxin.

Dochez reported upon his antitoxin in January, .1924.

The Dicks reported upon theirs in April, 1924.

The Dicks' work is epoch-making because, (1) they developed a specific toxin. (2) They experimented on human subjects. (3) They developed a test for susceptibility. (4) They measure the extent of an individual's immunity. (5) They developed an antitoxin. (6) They protect susceptible individuals by the use of toxins. (7) They produced typical signs and symptoms of scarlet fever by larger injections of the toxin.

The Dick test consists of intradermal injections of the specific toxin and of heated toxin as controls. There are four types of reactions, to-wit: positive, negative, pseudo-positive and combined positive. The pseudo-positive is a negative reactive and is probably a protein sensitization reaction; in appearance the toxin test and the control are nearly alike. In the combined reaction there is a protein reaction plus a toxic reaction; the toxin test is more marked and lasts longer than the control.

The positive reaction is of three grades, (a) marked redness and marked swelling; (b) marked redness and mild swelling; (c) mild redness and little or no swelling.

A skin test dose is the amount of toxin which is necessary to produce a two plus reaction by Dick test.

A unit of antitoxin is the amount which will neutralize 100 skin test doses.

For practical purposes it has been recommended that 30 to 60 c. c. for adults and 10 to 15 c. c. for children is the usual quantity for a dose.

Passive immunity from the use of the antitoxin lasts about two to three weeks.

An antitoxin is not antibacterial.

Active immunity produced by sufficient dosage of the toxin seems to be permanent, at least for several years.

The best immunizing dosage seems to

be the following: 500, 5,000 and 30,000 skin test doses with an interval between two successive doses of two weeks.

Scarlet fever may be classified as follows: simple, toxic, septic and malignant.

The simple is extremely mild; the toxic has severe general reactions; the septic has complications; in the malignant, death occurs within 48 hours.

The infection starts usually in the throat. It, however, may be from a wound infection.

The complications may be due to the hemolytic streptococci or to allied organisms.

The toxin seems to have a selective destructive reaction on the glomeruli and tubules of the kidneys causing nephritis.

The kidney injury is prevented by an early administration of antitoxin.

Complications are usually ameliorated by early use of the antitoxin.

The hemolytic streptococci seem to grow better with the specific toxin unneutralized than with the use of the antitoxin.

Immunes may be carriers.

Relapses occur where one attack fails to immunize so that a negative Dick test is not obtained.

The procedure in an epidemic is: make a Dick test on entire population liable to be involved and if possible examine all throats for hemolytic streptococci.

Read Dick tests and plates at the end of 24 hours. The population is divided into four divisions.

(1) Negative reactors without the streptococci.

(2) Negative reactors with the streptococci.

(3) Positive reactors without the streptococci.

(4) Positive reactors with the streptococci.

Nothing is done for those in class one. Those in class two are isolated till their throats can be freed from the streptococcus hemolyticus or until proven harmless. Class three are promptly given immunizing doses of toxin. Class four are given prophylactic antitoxin and inside of two weeks are started on immunizing doses of toxin and their throats are treated to rid them of the streptococcus hemolyticus.

Antitoxin should be given intramuscularly except in the dangerously ill, then intravenously.

In anticipation of exposure, children should be given the Dick test and if found susceptible should be immunized by three doses,—500, 5,000 and 30,000 skin test units. Doses at intervals of two weeks between two successive doses.

Each child before receiving the antitoxin should be tested for sensitization by an intradermal test.

In case a sensitization to serum is found, the antitoxin should be given at intervals of two hours. The first dose should be exceedingly small; each succeeding dose may be gradually increased.

James C. Small, M. D., (Med. Jour. & Rec., Jan. 20, 1926, p. 82) gives a general discussion of scarlet fever. He says the first unmistakable account of scarlet fever was by Daniel Sennet of Wittenberg, about 1625, but it remained for the great Sydenham in 1675 to describe the disease in full detail. The disease was common in Europe in the eighteenth century and first appeared in America, according to Craigen, in 1735. Its inception was in New England, where it gradually spread. It reached New York in 1746. With the beginning of the era of bacteriology a search was made for the causative organisms. It was early found that streptococci were consistently found in the sore throats accompanying scarlet fever, but streptococci are found in many conditions.

In 1902, Moser and Von Piquet obtained streptococci from the throats of scarlet fever patients and by injecting animals with the killed cultures succeeded in producing a serum which in their hands gave hopeful results in treatment. Confirmation of the results were obtained by some workers but disappointment came when others attempted to repeat the experiments.

Miss Tunnicliff, of Chicago, also in 1902 demonstrated that the streptococci from scarlet fever throats all belonged to one strain or closely allied strains and that they differed definitely from streptococci of other sources. She also showed that scarlet fever subjects had no antibodies against these streptococci in the beginning of their illnesses but did have these during their convalescence. Even after these discoveries the idea prevailed that the etiologic factor was a filterable virus.

In 1918 it was found that convalescent serum blanched the rash in an area about its injection. This is known as the Schultz-Charlton phenomenon.

Two groups of workers have given us our present conception of scarlet fever. The eastern group consisted of Avery, Dochez, Lancefield, Bliss, Sherman and Blake; George and Gladys Dick, of Chicago, constitute the other group. The larger group have devised better means of differentiating the scarlet fever strain of streptococci from other strains, confirmed the scarlet fever strain as the cause of scarlet fever, developed a specific serum and proved that the serum is curative. The work of the Dicks is the more epoch making in that they first recognized that the lack of progress in the study of scarlet fever was due to the lack of susceptible animals and, in departing from custom in the use of human subjects, proved definitely, what had been suspected, that scarlet fever is produced when susceptible animals are inoculated with the scarlet fever strain of streptococci; second, they produced, in a test tube, toxin which produced the signs and symptoms of scarlet fever, and with this toxin

they developed a test to determine whether an individual has a natural immunity to, or is susceptible to, scarlet fever. They produced typical scarlet fever symptoms by injection of the toxin. They proved that susceptible persons could be rendered immune by the injection of the toxin. They also proved that an antitoxin could be produced which neutralized the toxin during acute attacks.

The streptococci of scarlet fever locate as a rule in the throat where they grow, producing soluble toxins which are absorbed and produce the general symptoms.

The complications and sequelae may be due to the toxemia or the streptoccemia or to both. The bacteria may locate in areas other than the throat and produce chronic effects. The nasal sinuses, middle ears, cervical glands, etc., are favorite sites for invasion and when the bacteria remain there, such infected individuals become carriers of the disease.

Small believes that immunization of proven susceptible indivduals is the best method of stamping out scarlet fever. He concludes his paper by stating that an educational program whereby these facts are taken directly to the pubic is the outstanding need at present of the scarlet fever prevention program.

Donald M. Fraser (The Public Health Journal, April, 1926, p. 151) gives a short paper on the development of scarlet fever research. He mentions the work of Sydenham in 1661, and Marmore and Schottmuller's early study of streptococci. In 1885 there was much evidence to show that hemolytic streptococci were the cause of scarlet fever. He mentioned the work of Moser and Von Pirquet (as already told in other abstracts). The dose of Moser and Von Pirquet's serum was 200 c. c. and this prevented its becoming popular in spite of good results.

Gabretschewsky and associates, of Institute of Moscow, about 1907, used a killed broth culture of hemolytic streptococci to immunize 1500 persons. In about 15 per cent of the persons injected, a rash, sore throat, vomiting, strawberry tongue and fever resulted. Rarely was there desquamation. In persons who had had scarlet fever and were injected with the vaccine no such symptoms resulted. The vaccinated children were apparently rendered immune. They definitely stated that the hemolytic streptococci were the cause of scarlet fever.

Schultz and Charlton's blanching test is detailed, as is the splendid work of the Dicks and Dochez. Dochez's antitoxin was made by injecting a horse with the living streptococci. Fraser says passive immunity lasts certainly 10 to 14 days. In one group tested, 68 per cent were immune after 30 days. In another group, 63 per cent were immune after 24 days. Protection begins within a few hours after having the antitoxin injection. One group showed 94 per cent immunity in 48 hours, and another smaller group 100 per cent protection in 48 hours. The antitoxin should be given early after exposure. The incubation period of scarlet fever, it should be remembered, is three to four days, rarely up to seven. In some cases it may be wise to take a Dick test and to examine throat for hemolytic streptococci before giving the antitoxin. This, however, causes a loss of 24 hours. It must be kept in mind that the serum and anaphylactic reaction may occur. Serum sickness resulted in 20 to 60 per cent of those given the antitoxin.

Perry A. Bly (N. Y. State Jr. of Med., Apr. 1, 1926, p. 309) says scarlet fever is a combined bacterial and toxic invasion. An antitoxin has been produced but an antibacterial serum has not been produced. Therefore, passive scarlet fever immunity consists simply of an ability to neutralize the scarlet fever poison.

In 1912, Reiss and Jungmann published reports to the effect that serum from convalescent scarlet fever cases was beneficial in treatment and should be used in severe cases. They noted particularly the rapid disappearance of toxemia after its use.

In 1915, Zingher advocated the use of whole blood, normal or from convalescent scarlet fever cases, convalescent blood for severely toxic cases and normal blood in septic complications. The author followed Zingher's treatment from 1915 to 1924 with excellent results. In 1924 he began using Dochez's serum. Results from the two methods were equally good.

As regards other treatment: the nose and throat are flushed out gently with normal saline and argyrol applied every few hours. The ears are frequently inspected and incised when bulging. He cautions particularly about nephritis and arthritis as complications.

Dwight M. Lewis (Med. Jour. and Record, Mch. 17, 1926) reports observations which lead him to state that scarlet fever is mainly disseminated by nasal carriers. The peeling from the skin is probably not the source of contagion so much as the excretions and discharge from the nose, mouth, cheeks and lips. A nasal carrier may be a scarlet fever convalescent or a scarlet fever contact who has had some other infection. An immune carrier, with some other respiratory tract infection seems to harbor the most dangerous organisms.

The complications and sequelae, which commonly come from scarlet fever, Lewis thinks, are not from the true hemolytic streptococci of scarlet fever but are from accompanying streptococci which are closely allied and of various strains.

P. S. Åstrowe and D. M. Nigro (J. Mo. State Med. Assoc., Jan. 1926, p. 14) discuss the technic of making the Dick test. An intradermal injection is made of 1/10 to 1/20 c. c. of the scarlet fever toxin on the well cleansed forearm. A control test consisting of toxin heated to boiling temperature for one hour is placed two inches or more below the first injection. Make readings at the end of 24 hours. According to Zingher they recognize four types of reactions: (1) Positive, (2) negative, (3) negative pseudo-reaction, (4) positive combined reaction. The positive is of three grades; (a) two-plus, when there is intense redness and induration; (b) one-plus, slight swelling but of no moment, with redness; (c) a plus-minus, in which redness varies from red to pink, but with no swelling.

In a negative pseudo-reaction there is equal reaction in the two injected areas. In the positive combined reaction there comes certain reactions in both but the unheated toxin produces a definitely greater reaction than the control.

In the majority the reaction is clear cut. The value of the test has been proven over and over again. The authors say, "To date among the published reports and in our own cases not a single case found to be immune by the test has contracted the disease." The non-immune cases contract scarlet fever when exposed.

A positive test, to repeat, consists of a reaction from the unheated toxin definitely greater than from the heated toxin; the reaction is due to the

toxic effects of the toxin on the tissues—there being no antitoxin in the tissue to neutralize the toxin.

Regarding immunization by use of toxin injections, the authors used three weekly injections consisting of 100, 250 and 500 skin test doses respectively. Local tenderness and swelling occurred at site of injection in about half of those treated. In one individual there was a rise of temperature with sore throat and vomiting. Several cases vomited within a few hours after their injections. No rash was noticed in any case. Nose bleeding occurred once. Reactions came only after the first injection and invariably subsided in 24 hours. Of 75 cases given immunizing treatments, 68 were retested after eight weeks; 46 gave negative tests. The others reacted positively but less so in each instance than at the former test.

Beverly Hannah (The Public Health Journal, Apr. 1926, p. 165) says the Dicks produced experimental scarlet fever by two distinct strains of hemolytic streptococci.

Hannah gives a classification of scarlet fever as follows: simple, toxic, septic and malignant. The septic is severely toxic and also has some nose and throat involvement with tendency to suppuration. The malignant die in the first 24 to 48 hours; exposure is the chief point of diagnosis.

Hannah says the use of convalescent serum began with Weisbecker in 1897 with results not encouraging. Reiss and Jungmann in 1912, Zingher in 1915, Kling and Widfelt in 1917, Weaver in 1918, Bernbaum in 1922, reported good results with the convalescent serum. At the Riverdale Isolation Hospital 81 extremely severe cases were treated. The results proved the value of the method, when the serum was administered early.

Marmorek in 1895 developed antitoxin for scarlet fever by injecting horses with living streptococci. Moser used the same method in 1902; he obtained his original cultures from the heart blood of fatal cases. Savchenko in 1905 also developed an antitoxin. The large doses necessary were the cause of the failure of the antitoxin at that time.

Dochez's antitoxin was introduced first in January, 1924, and the Dicks' in April, 1924. The methods of manufacture of the two are not exactly alike. The Hygienic Laboratory of U. S. Public Health has defined a unit of antitoxin as that amount which will neutralize 100 skin test doses of toxin. Clinical experience has shown that for the present the dosage may be stated in c. c.; e. g., 30 to 60 c. c. for adults and 15 to 30 c. c. for children, repeated within 24 hours if needed. Always give a large initial dose intramuscularly. Intravenous may be dangerous. Two hundred scarlet fever cases have been treated at the Riverdale Isolation Hospital. The routine treatment is as follows: all acutely ill cases get antitoxin; those not acutely ill, with fever below 101 but with clinical signs and symptoms definite are given antitoxin; those with signs indefinite or mild are given a Dick test. Results cannot be given until antitoxin has had exhaustive trial. Serum reaction occurred in 49 per cent of the cases. There have been no anaphylactic reactions.

L. M. Murray (The Public Health Jour. Apr. 1926, p. 157) discusses the detail of the Dick test. (This has mainly been given in other abstracts.) He says a slightly positive reaction is a faintly red area, one to two cm. in diameter; the positive reaction is bright red, slightly swollen and tender, 1.5 to 3 cm.; the strongly positive is intensely red with definite swelling and tenderness, 3 cm. or more in diameter. The negative pseudo-reaction is a reaction that comes with both control and test and fades more rapidly than a positive reaction, but equally at the two sites. The cause of the pseudo-reaction probably is a sensitization to the proteins of the streptococci. The Dicks produced scarlet fever in persons who gave a positive test. They found in 63 persons with negative tests, that none developed scarlet fever by exposure; also they were unable to produce scarlet fever in a negative reactor by inoculation.

Zingher tested 141 cases of scarlet fever within the first five days of the onset of the disease and obtained 100 per cent positives. He also tested 170 during convalescence and obtained 93 per cent negatives.

Graham, of Toronto, did Dick tests on less than one month old infants and their mothers and found 73 per cent of the infants giving identical reaction to their respective mothers. Murray reports that 88 per cent of scarlet fever convalescents not treated with antitoxin become negative to Dick test by the end of the third week and 92.5 per cent were negative by the fifth week. Of 150 cases of scarlet fever only one gave a positive Dick test on discharge. One interesting case is reported. The Dick test remained positive throughout the course of the scarlet fever attack; the child was not given antitoxin; in the fifth week there was a relapse. The child had not developed a sufficient immunity in the first attack to give a negative Dick test so as to prevent a relapse. He concludes that all the claims of the Dicks have been justified.

Dr. A. Zingher (Jour. Med. Soc. N. J., Mch., 1926, p. 109) says Kline in 1885 found hemolytic streptococci in cases of scarlet fever during a milk born epidemic. He mentions Moser's serum, that of Sovchenko the work of immunizing humans by the toxin of Gabritschewsky, and the accomplishments of the Dicks.

Zingher says the skin test dose is 0.1 c. c. of that solution of the toxin which will give a two plus reaction. They began their immunizing attempts by giving five skin test doses and repeating. Zingher first immunized his own children, ages 5½, 3 and 2. They were still immune 16 months afterward. They now give four weekly doses of 250, 1,000, 2,000 and 4,000 skin test doses.

He had 37 children who developed scarlet fever after the Dick test; all had given positive tests and during convalescence gave negative tests. I quote from him, "With the exception of two doubtful cases we have not seen any definitely negative Dick reactors develop scarlet fever."

The amount of antitoxin in a person's blood can be measured by making a Dick test with varying combinations of the toxin. The toxin can be neutralized by the antitoxin in multiple proportions. This places the toxin in a class with the other soluble exotoxins such as that of diphtheria and tetanus.

The serum is antitoxic and not antibacterial. Therefore the person can have an immunity to the toxin and yet have otitis media, endocarditis and other complications from the growth of streptococci. Probably, however, the bacteria grow better when the toxin is unneutralized.

The toxin for the Dick test keeps for months. The probabilities are that when immunity is well established by toxin injections it will be perma-

nent because the scarlet fever streptococci are so prevalent that sufficient inoculations will result to stimulate further production of antitoxin.

Dochez' and Dicks' sera are equally efficacious and both are inferior to Moser's as this is antitoxic and polyvalent antibacterial. The Dick and Dochez sera have little effect on the septic complications.

Immunity to scarlet fever is transferred from mother to offspring. Immunity is more difficult to be developed in those giving strongly positive reactions than in those giving weakly positive reactions.

C. W. Duval (New Orleans Med. and Sur. Jour., Jan. 1926. p. 436) regards kidney changes as a constant accompaniment of scarlet fever and hence its most important pathology. The changes are in the glomeruli and indicate that the toxin has a selective action. Antitoxin, if properly used, prevents damage to the kidneys.

M. Izabalinsky and J. Lipkin (Vestnik Microbiologii i. Enidemiologii, Sarato. 4 1925, p. 3; abstr. J. A. M. A. LXXXVI, p. 1257) studied the scarlet fever streptococci from various sources. They noted a diplococcus streptococcus as had been emphasized by Gabritchewsky. Not all were hemolytic. In making the skin test with their toxin they found 70 to 76.2 per cent positive reactions below the age of 15; between the ages of 15 and 25 there were 53.1 per cent positives and over 25, 33.3 per cent positives. In 40 persons with a scarlet fever history the test was positive in 22.5 per cent. They think there may be a local form of the disease in which only local immunity is engendered and have the positive tests after one had been supposed to have had the disease.

Dean P. Crowell (J. A. M. A. LXXXVI, p. 1283) reports the case of a boy who slept with his brother up to the time of the making of a positive diagnosis of scarlet fever in his brother and then was kept away from all possible source of contagion for eleven days; at the end of this time the infected brother was allowed to associate with the family. The well brother straightway developed a sore throat and after an incubation period of ten days, scarlet fever. The dangerous period for contagion is convalescence.

Janvier W. Lindsay, E. Clarence Rice and Maurice A. Selinger (J. A. M. A. LXXXVI, p. 1191) present an analysis of the scarlet fever work at the Garfield Memorial Hospital. Their conclusions are: The Dick test is reliable; it often assists in a diagnosis: susceptibles may be immunized: care should be used to graduate the doses of toxin for immunization so as not to get too severe reactions. Dochez' antitoxin is reliable; the early use of antitoxin reduces the incidence of severe complications; a single large dose is better than several small ones; the intramuscular route is usually preferable; the intravenous method may be used in severe cases; they suggest that all patients be tested for sensitiveness to serum.

G. H. Percival and C. P. Stewart (Edinburgh Med. Jour., Feb. 1926; abstr. J. A. M. A. LXXXVI. p. 1166) report a study of scarlet fever from nephritis in the Edinburgh City Hospital. The death rate was 6.9 per cent in 1921-22 and 12 per cent in 1923-24. The incidence of the complications also increased from 1.4 in 1919 to 4.92 in 1924. The nephritis came on the eighteenth day. Nephritis was just as likely to come from a mild case of scarlet fever as from a severe case. The chief changes one case developed were acute degenerative changes in the tubules.

Lin Chia Swee and H. M. Jettmar (Nat'l Med. Jour. of China, Shanghai, Dec. 1925; abstr. J. A. M. A., LXXXVI, p. 1167) found streptococcus hemolyticus in each of eighteen cases of scarlet fever. Out of 1275 Dick tests 47.7 per cent were positive. The morbidity and mortality from scarlet fever ni Northern China are both high.

M. Gerbasi (Pediatria, Naples, Feb. 1, 1926; abstr. J. A. M. A., LXXXVI, p. 1171) made many experiments concerning specificity of the hemolytic streptococci of scarlet fever and thinks he has shown a lack of marked specificity.

O. C. Young and Paul F. Orr (J. A. M. A. LXXXVI, p. 1340) recommended, after exhaustive research, three immunizing doses at two weeks intervals of 500, 5,000 and 30,000 skin test doses. The two weeks interval is considered important. The three injections given at two weeks intervals is just as effective as were five injections at weekly intervals.

Leane and Dreyfus See (Bulletins de la Societe Medicale des Hopitaux, Paris, March 19, 1926, p. 452; abstr. J. A. M. A. LXXXVI, p. 1664) claim that by the use of Zoller's toxin of streptococcus hemolyticus which is purified by acetic acid and sodium chloride, pseudo reactions are avoided. After various tests they conclude that the Dick test is not of value in diagnosing scarlet fever, past or present, nor is it reliable in indicating susceptibility or immunity, nor does it prove the streptococcal etiology of scarlet fever.

A. Bacciehetti (Clinica Pediatrica, Modena, June, 1926, p. 361; abstr. J. A. M. A., LXXXVI Oct. 2, 1926, p. 1162) concludes from tests of 70 children of all ages, that neither the Dick test nor the Di Cristina and Caronia test is a reliable index of the susceptibility of individuals to scarlet fever.

J. Takaki (Wiener klin. Wachenschft. Vienna, Mch. 18, 1926, p. 325; abstr. J. A. M. A., LXXXVI, p. 1669) was unable to confirm any of Caronia's experiments or claims. The supposed organisms are probably autolytic elements he thinks; and the protection obtained is probably due to the blood used in the culture media.

R. Debré, Lamy and Bonnet (Bulletin de la Societie Medicali des Hopitaux, Paris, Mch. 19, 1926, p. 467; abstr. J. A. M. A. LXXXVI, p. 1664) applied the Dick test in 677 children; it was positive in 25 per cent under one year and in 44 per cent from one to three; it gradually dropped to 15 per cent at 15 years. In 122 adults there were 10 per cent positive. At the onset it was positive on eight of 19 children. In all of 64 convalescents it was negative. In 10 instances a mild form of scarlet fever developed within 48 hours after the streptococcic toxin had been injected. This may have been a negative phase in carriers or only a coincidence. The test was negative in nine of ten cases of other forms of streptococcal disease. They conclude that the Dick test is not a help in diagnosis but may be a help to ascertain susceptibility and immunity.

F. A. E. Silock (Lancet, London, Dec 26, 1925; abstr. J. A. M. A. LXXXVI, p. 584) did Dick tests upon 48 cases of scarlet fever from the first to the fifth day of the attacks; 68.8 per cent reacted

positively. On and after the tenth day 88.4 per cent gave negative reactions.

A. Beresneff (Prophylaktitcheskaia Medicena, Kharkov, Oct. 1925, p. 12; abstr. J. A. M. A., LXXXVI, p. 80) observed 129 untreated cases of scarlet fever and 103 treated with Zlatogoroff's vaccine. The vaccine was given every half to two hours until the fever and eruption disappeared. The eruption began fading the second day and was gone in four to five days. Nephritis was less rare with this treatment, than with usual treatment. Other complications were not affected. The mortality was 8.7 per cent among the treated and 11 per cent among the untreated.

Zlatogoroff vaccine consists of the streptococci killed by 0.5 per cent phenol,—1000 million per c. c.

Protective inoculations were given to 1939 children; one to three injections were given at intervals of five to seven days. Only two of the vaccinated children contracted scarlet fever. These were mild. None were isolated. About 1495 Dick tests were used. It was positive in 14 who had histories of scarlatina, 20 per cent of vaccinated and in 25 per cent of the unvaccinated who had not had scarlet fever. The difference between the groups is insignificant; there were a large number of false and uncertain reactions.

A. G. Robb (Brit. Med. Jour. Jan. 2, 1926; abstr. J. A. M. A., LXXXVI, p. 722) has had such excellent results from the use of adequate early doses of scarlet antitoxin, that he concludes that the quarantine may be reduced 50 per cent. Early cases may be completely abated. Desquamation and complications may be prevented and greatly diminished.

T. G. Hull (Jour. of Lab. and Clin. Med., Dec. 1925, p. 260) had experience in making Schick test on recovered scarlet fever cases which makes him think that scarlet fever destroys diphtheria immunity. Of 23 who had scarlet fever 20 gave a positive Schick, while with 107 who had not had scarlet fever only 56 gave a positive Schick.

F. G. Blake and J. D. Trask (N. Y. State Jour. of Med., Dec. 15, 1925; abstr. J. A. M. A., LXXXVI, p. 307) asserts that antitoxin is a specific for uncomplicated scarlet fever and indirectly reduces the amount of complications. As much as 3,000 to 10,000 units should be given and preferably in one dose.

M. Skrotzky and M. Burdakh (Prophylaktitcheskaia Medicina, Kharkov, Nov., 1925, p. 28; abstr. J. A. M. A. LXXXVI, p. 285) think that convalescent serum is the most efficient preventive and that every community should store it ready for use. They inoculated 94 children in contact with scarlet fever, with the convalescent serum, and only two developed scarlet fever. These were mild.

J. Miller (Public Health Journal, Toronto, Nov. 1925; abstr. J. A. M. A., LXXXVI, p. 15) says scarlet fever has been endemic in Kingston for four years—2,000 children had probably been affected in this time. The virulence has varied. In 1922 and 1923 it was so mild that many cases passed unnoticed. Two per cent of the admissions to the City Isolation Hospital died. The situation became more serious in 1925. Inoculation was begun, 1155 being vaccinated. There were no severe reactions. Nurses were vaccinated. Adults tended to have severe reactions. The epidemic abated with the vaccinations.

Abraham Zingher (J. A. M. A. LXXXVI, p. 136) gives great credit to the early work of Gabritschewsky, Moser, Sarchenko for the present status of the scarlet fever problem.

M. Guiffre (Pediatria, Naples, April 15, 1926, p. 393; abstr. J. A. M. A., LXXXVI, p. 1873) prepared toxins from streptococci of various sources and made skin tests with them. The positive reactions occurred in about the same proportions to the negative as the Americans had found with the Dick test.

He tested with his toxin 12 subjects before, during and after scarlet fever. In three of them the reactions were constantly negative. In several the positive turned to negative and remained negative during the course of the disease. In two the negative reaction changed back to positive.

H. Diecher (Jahrbuch fur Kinderheilkunde, Berlin, Mch. 1926, p. 74; abstr. J. A. M. A., LXXXVI, p. 1876) confirms absolutely the American conception and work on scarlet fever. He has found that not every strain of scarlet fever streptococci produces the best toxin with which to work. He thinks the best method of identifying or selecting the correct strain is by agglutination. Cases who react negatively to scarlet fever toxin are likely to react positively to toxin from other strains. He had one child in whom the first attack of scarlet fever failed to confer sufficient immunity to protect and hence had a second attack. He rates the Dick test at 98 per cent perfect, and believes its failures are due to changes and variability in the individual susceptibility.

N. Kniazeff and L. Alexandrova-Portniagina (Prophylaktitckeskaia Medicina Kharkov, March, 1926, p. 10; abstr. J. A. M. A., LXXXVI, p. 1878) in a study of hemolytic streptococci, found them in the throats of 50 per cent of all cases of scarlet fever, in the blood and spinal fluid of the seriously ill ones, which was about three per cent, and always at autopsy. They were more likely to be found in severe than in mild cases. They were found in about seven per cent of those in contact with scarlet fever.

The hemolytic property gradually waned during the progress of the disease, and non-hemolytic strains of streptococci became prevalent.

In proper media the hemolytic character could be preserved for at least four months. Associated organisms seemed to have no influence on the hemolytic phenomenon. The hemolytic activity of the bouillon cultures was altered by adding blood of scarlet fever patients.

A. C. Miller (J. A. M. A. LXXXVI, p. 1855) reports a child who had a doubtful scarlet fever, but from whom two other persons contracted typical cases and who later, after an injury, himself had a scarlet fever attack.

A doctor in South Dakota (J. A. M. A. LXXXVI, p. 1856) raises the question about the possibility of scarlet fever being diagnosed German measles.

Gorter and DeKorte (Nederlandsch Moondschifit v. Geneeskunde Leiden, 13, 1926, p. 383; abstr. J. A. M. A. LXXXVI, p. 1955) advances the opinion that in the filtrate from streptococci cultures, is the virus of scarlet fever, not in a toxin simply but a multiplying virus.

The blanching and neutralizing effects of certain normal sera suggest that the virus antigen may form antibodies for the streptococcic toxin

and vice versa. The invisible diplococci of Di Cristina and Caronia on culture media free from streptococci may be associated with the cultures of streptococci of Dick, Dochez and others.

George F. and Gladys H. Dick (Northwest Medicine April 1926, p. 200) present a general resume of the facts on scarlet fever. At present they are using for immunization 47,000 skin test doses and more if necessary. A negative test must be obtained to insure an immunity. One person required 160,000 skin test doses. They have had no seriously bad effects. In the past three years they have had the opportunity to observe the results of immunization to scarlet fever in the nurses and internes of two contagious disease hospitals. Up to the time of starting immunization among them scarlet fever was prevalent among them Among the nurses and internes were found 360 giving positive tests and who were immunized; no scarlet fever developed among this group; in a control series of 242 who were not tested and not immunized 10 per cent developed scarlet fever. In another series of 608 susceptible by skin test and immunized, no scarlet fever developed, though they had exposure. The immunization has been found to last at least two years. The immunity is developed two weeks after the last dose of toxin.

In discussing antitoxin they mention the work of Marmorek, Moser, Courmant, Dochez and Sherman. Courmant's work was in 1898. He injected horses with living cultures after having first given them filtrate or attenuated cultures. The authors inject horses with the soluble toxin for their antitoxin.

They have found that 1,000 skin test doses are sufficient to produce transient symptoms and signs of scarlet fever, provided there has been no previous immunization. An antitoxin dose capable of neutralizing 20,000 skin test doses has been found to have therapeutic effect. A prophylactic dose is used up to the time the rash appears. After the therapeutic dose the rash and all symptoms should fade inside of 24 hours. If fading does not occur insufficient antitoxin was used. One result of the antitoxin is to unmask complications and also to reduce complications. In a series of antitoxin cases complications result in eight per cent and in the controls in 38 per cent. In two adults who had large amounts of albumin, two therapeutic doses each put them on the rapid road to recovery with the nephritis as well as with the scarlet fever. The antitoxin should be given early before the complications arise.

In epidemics the procedure is to make skin tests and if practical throat cultures on blood agar plates, of the population in question.

Tests and plates are both read at the end of 24 hours. Susceptibles are separated from the immune. Then both divisions are divided again into those with and those without hemolytic streptococci. The immune without the bacteria are dismissed. The immune with streptococci are isolated on the ground that they are carriers.

The susceptible persons without streptococci of scarlet fever are given immunizing doses of toxin and kept away from danger of contagion. The susceptible ones with hemolytic streptococci are given antitoxin followed in 10 days to two weeks with toxin for immunization. They have used this method in 218 families and in four epidemics in institutions and had no new cases after 48 hours.

John F. Anderson (The Jour. Med. Soc. N. J., June, 1926, p. 273) says that in 1924, in 47 states of the union, there were reported 184,738 cases of scarlet fever, with 3109 deaths—a case mortality of 1.59 per cent. No estimate of permanent damage to those who recovered is possible. Scarlet fever ranks fifth in the cause of death in the ages four to nine.

Editorial (J. A. M. A., LXXXVI, p. 1190) says two physicians in 1925 died from scarlet fever.

W. L. Aycock and P. Eaton (Jour. of Hygiene, Baltimore, Nov., 1925; abstr. J. A. M. A. LXXXVI, p. 147) says multiple cases of infection to scarlet fever occurs in a family by infection from one case to another. The fact that the incubation period is short may make them seem like simultaneous infections.

Veldhuyzen and Vos (Nederlandsch Tijaschrift v. Geneeskunde, Amsterdam, Nov. 7, 1925, p. 2087; abstr. J. A. M. A., LXXXVVI, p. 80) say in 1924 there were 1310 cases of scarlet fever in Amsterdam. All but 282 were in separate families. There were numerous cases of sore throat at the same time. It is suggested that there might have been a relation between the sore throat cases and the scarlet fever. The latter may have been carriers of a mild infection which tended to immunize to scarlet fever. This would explain the lesser susceptibility of the older children.

E. Papoff (Prophylakititcheskaia Medicinia. Kharkov, Dec. 1925, abstr; J. A. M. A. LXXXVI, p. 729) using a vaccine prepared by the Gabritschewsky or Zlatogoroff method, inoculated 790 children, most of them three times. Only five of them contracted scarlet fever. A percentage of 0.63. In the unvaccinated the percentage was seven.

Scarlatina signs and symptoms occurred consistently, even passing to typical rash with many following vaccination.

F. A. Pringle (The Jour. Med. Soc. N. J., June, 1926, p. 279) says recent exposure, general malaise, sore throat and vomiting within 24 hours, a diffuse red eruption beginning on the chest and spreading rapidly, makes a typical and distinct case of scarlet fever. When, however, other infectious diseases exist in the same locality or if the type is very mild, the diagnosis is not easily made. He speaks of a surgical and puerperal scarlet fever in which the focus of infection is not the nasopharynx but the site of the lesion.

He reports three cases who had a positive Dick test early in the course of scarlet fever and also on the eighteenth day. They had relapses in the fourth week. He raises the question of relationship between scarlet fever and cases of septic throat due to streptococcus hemolyticus. The throats in the two conditions appear identical. Some of his cases of septic sore throat desquamated.

His results from use of the antitoxin are only mildly encouraging. They treated 50 cases and used 50 as controls. The treated ones had normal temperature on the sixth day, three days subsequent to injection, whereas the untreated reached normal on the eighth day. The complications in the treated and untreated were as three is to five; the complications were less severe and there were no kidney complication in the treated. In the septic cases they gave the antitoxin intravenously. If complications developed after the antitoxin was given they were not benefited by the serum. About 16 per cent had the serum rash. Aspirin every three to five hours lessened the severity of the scarlet fever.

Edward E. Worl (The Jour. Med. Soc. of N. J., June, 1926, p. 287) says negroes rarely have scarlet fever. There is a desquamation from the trachea, the bronchi, the intestines and kidneys as well as from the skin according to Worl. The Germans make mention of a characteristic odor.

akin to that acquired by keepers of wild animals. He says to him there is a musty smell.

S. de Villa (Pediatria, Naples, Nov. 15, 1925, p. 1225; abstr. J. A. M. A. LXXXVI, Jan. 2, 1926, p. 76) found complement fixation positive with extract of the scales in all cases. He believes this to be specific.

S. P. Chen (China Med. Assoc. Jour. Shanghai, Oct. 1925; abstr. J. A. M. A., LXXXVI, Jan. 9, 1926, p. 152) made an antitoxin from the hemolytic streptococci obtained by throat swabs and found that it had curative power, especially in severe cases if administered early. It also benefits erysipelas developing in the course of scarlet fever.

G. H. Percival (Edenburgh Med. Jour., XXXII, Nov. 1925, p. 763; abstr. J. A. M. A., LXXXVI, Jan. 16, 1926, p. 230) reports a case of suspected scarlet fever from which there developed erythema nodosum and which, when antitoxin was injected into it, gave a distinct blanching; from the same sample injections were made into the rash covered skin of scarlet fever. Typical Schultz-Charlton phenomenon resulted. No such reaction occurred in the two cases of rubella and in one of sun erythema.

H. B. Cushing and Longpre (Union Medicale du Canada, Montreal LV, Jan. 1926, p. 8; abstr. J. A. M. A., LXXXVI, May 22, 1926, p. 1666) reports that 75 nurses were given one immunizing dose of scarlet antitoxin. Nine per cent of them developed three weeks later a mild form of the disease. The previous experience had been that 15 per cent contracted a grave form. Antitoxin was used in 125 cases of scarlet fever—5 c. c. in muscle in mild cases and 10 c. c. by vein in severe cases. All recovered. In 200 cases treated by antitoxin in two hospitals there were fewer complications and these were milder than before the advent of the serum. There were no serum reactions after they began using concentrated antitoxin.

H. Henry and F. C. Lewis (Lancet, London, April 3, 1926, p. 709; abstr. J. A. M. A., May 22, 1926, p. 1663) says, taking a unit of antitoxin as that amount that will neutralize one skin test dose, 20 recovered children were tested for the number of units of antitoxin in their blood. Seventeen had 50 units; only eight non-scarlet fever children reached that figure. Nine of those who had had the disease reached 125. Only three of those not having the disease reached that number. Five of the scarlet fever cases reached 250 and one of the non-scarlet had that amount.

A. Skrotzy and M. Bardakh (Prophylatitcheskaia Medicinia, Kharhov, Nov. 1925, p. 28; abstr. J. A. M. A., LXXXVI, Jan. 30, 1926, p. 385) inoculated 94 children with pooled convalescent serum, with chloroform or phenol as a preservative and only two contracted scarlet fever. These two were treated at the end of the incubation period.

P. A. Bly (N. Y. S. Jour. of Med. N. Y., April 1, 1926, p. 309; abstr. J. A. M. A. LXXXVI, May 29, 1926, p. 1663) treated 34 cases of scarlet fever; twelve, all except four desperately ill cases, received convalescent whole blood; two had the organisms in the blood, the mortality was 25 per cent. Ten received convalescent blood serum; all recovered. Twelve received Dochez' serum and all recovered. Dochez' serum seemed to bring about a more rapid recovery than did the convalescent serum. He recommends large quantities of water, frequent irrigation of the bowels with saline solution, and flushing of naso-pharynx and painting of fauces with 20 per cent solution of silver protein, six to eight times per day. In 1133 cases otitis media occurred in 7.95 per cent and nephritis in 1.63 per cent.

Edward C. Rosenow (J. A. M. A., LXXXVI, Jan. 2, 1926, p. 9) says that with the Dicks' work the problem of scarlet fever has been solved. He reported last year upon a scarlatina antitoxin made seven years before. This was made by injecting a horse first with killed and then with living cultures. He demonstrated the identity of the toxin of the scarlet and other strains of the hemolytic streptococci. The hemolytic streptococci may easily change from one type to another and may account for development of scarlet fever epidemics.

In a study of the precipitin reaction of hemolytic streptococci it was observed that virulence and production of toxin ran parallel with the precipitin reaction to scarlatina immune serum. This is a method to ascertain if hemolytic streptococci are of the scarlet fever strain.

Rosenow says the Dick test is a reliable test of the susceptibility of the skin to the scarlatinal rash. He thinks that the skin may be immune to the bacterial toxins while the throat and other tissues are highly susceptible to the bacteria.

THE ITALIAN LITERATURE ON SCARLET FEVER

Langley Porter (Archives of Pediatrics, March, 1926, p. 197) presents the splendid review of the Italian literature from which the following abstracts are taken. He says: "It seems that the work is important enough to be presented to the American profession for their critical perusal. It may be of interest to add that Orloing, Dufour, Belot, Moreau, and Boisserie, in Italy, La Croix in France, Torello in Spain, Taisbovico in Hungary, Szogatoroff in Russia have published reports of researches which confirm the Italian claims." He also says: "Meyers and Burger of Dusseldorf have failed in their attempts to confirm the findings of the Italian savants."

The work on Di Cristina's organisms for scarlet fever is a product of the pediatric schools of Italy, especially those of Rome, Naples and Palermo. The workers think they have been able to satisfy Koch's law completely: they have found and isolated the specific organism of scarlet fever; they have reproduced the disease in humans and in animals; they have protected susceptible individuals by the use of killed cultures. The specificity of the organism has been brought to trial against all serological tests and been proven specific. And they have produced a curative vaccine.

The Italians are not unfamiliar with the work and claims of the American students of scarlet fever. They think the Americans have done splendid work but on the

complications of scarlet fever rather than the specific cause.

Di Cristina, (La Pediatria, 24, 1921 and 1, 1923; abstr. from Porter's Review of Recent Italian Literature on Scarlet Fever in the Archives of Pediatrics, Mch., 1926, p. 197), in 1924, found an organism, ovoid 0.2 to 0.4 microns in diameter, anaerobic, readily taking anilin stains, slow and scant in development, and producing what had the appearance of scarlet fever in young rabbits and guinea pigs. He was able to confer immunity by injection of inactivated cultures. The organism was universally found in the bone marrow and the blood of persons in the exanthematous stage and in experimentally infected animals. The organisms are usually found singly but may be in chains. They are often paired in old cultures.

Caronia and Sindoni (La Pediatria, 14, 1923; ref. cit.) confirmed the findings of Di Cristina and were able to produce the disease in humans by injection of the organism. They cultivated the bacteria from the blood, the bone marrow, the nasopharyngeal filtrates, and the spinal fluid, of every patient attempted, when in the exanthematous stage. They were not able to recover it in convalescent or recovered cases, nor in those ill from other diseases.

Four types of culture media have been used and the characteristic of the growth of the organism varies in the different media.

Sindoni (La Pediatria, 20, 1924, ref. cit.) made anaerobic cultures from 100 scarlet fever patients, 80 in exanthematous stage, and 20 in later stages suffering from complications. In each of these the organisms were recovered. They were not found in recovered cases nor in those with other diseases.

Vitetti (La Pediatria, 18, 1923; ref. cit.) took nasopharyngeal washings, passed them through a Pasteur filter and cultured the filtrates. The filtrate culture made from cases in the beginnings of attacks produced a growth of Di Cristina's organisms within 24 hours; those made from cases in full eruption had growth in four to five days; no growth at all occurred when children were desquamating nor were cultures obtained from diphtheria or streptococcic angina.

Catteruccia (La Pediatria, 1, 1924; ref. cit.) used centrifugate of 40 spinal fluids from scarlet cases in the exanthematous stage, and demonstrated Di Cristina's organism in all.

Sindoni (La Pediatria, 24, 1924; ref. cit.) isolated the same bacteria from a purulent meningitis 40 days after recovery from the true scarlet fever attack. The meningitis was a complication of the scarlet.

Ortaleva (La Pediatria, 21, 1924; ref. cit.) obtained the organisms from a neck abscess of scarlet fever origin.

Cartia (La Pediatria, 8, 1924; ref. cit.) grew them from four cases of otitis media-complications of scarlet fever.

Sindoni (La Pediatria, 1, 1924; ref. cit.) grew them from a purulent pleurisy of scarlet fever origin.

Ritassa (La Pediatria, 18, 1923; ref. cit.) grew them from urine of patients in the exanthematous stage.

Nastasi (XI. Congresso pediatria Italiano, Ottobre, 1924; ref. cit.) found convalescents' urine uniformly free of Di Cristina's organisms but found them always present when nephritic complications existed.

Sindoni (La Pediatria, 16, 1923; ref. cit.) macerated scales from scarlet fever desquamation, in normal salt solution, even after they had been in sterile petri dishes for four months, and grew Di Cristina's organisms therefrom.

Sindoni (Rinascenza medica, 5, 1924; ref. cit.) after producing the disease in animals, transferred it to other animals by injection from the infected ones.

Caronia and Sindoni (La Pediatria 14, 1923; ref. cit.) inoculated convalescent measles cases with Di Cristina's organisms and produced mild scarlatina. Their blood as in the cases of experimentally infected animals, and also spontaneous cases of scarlet fever, showed serologic immunity reactions.

The organisms produced in the serum, agglutination, complement fixation, increased opsonic activity and has also fulfilled Koch's dicta; this proves apparently the specificity of the organisms in scarlet fever.

Vitetti (La Pediatria, 23, 1924; ref. cit.) found scarlet fever serum contained agglutinins for the organisms and also that the opsonic index for them was correspondingly increased.

Di Villa (La Pediatria 11, 1923; ref. cit.) and Pollitzer and Rapisardi (La Pediatria, 20, 1924; ref. cit.) prepared emulsions of Di Cristina's cultures and also filtrates thereof and injected minute quantities of one or the other intradermally in 100 infants who had not had scarlet. Sixty tests were negative and forty positive. No reactions occurred in recovered cases nor in those who had previously had Di Cristina's vaccine. Nurslings and new born gave very positive reactions.

Sindoni (La Pediatria 5, 1923; ref. cit.) reports figures on 300 persons who had been vaccinated with Di Cristina's vaccine and exposed to scarlet; all remained well except one which had the vaccine only during the incubation period.

Piattelli (Policlinico sez. prat. Marzo, 1924; ref. cit.), Bora (Rinascenza medica, 19, 1924; ref. cit.), Romano (Rinascenza medica, 19, 1924; ref. cit.) Jacobovies (Orvosi Hetilop, Maggio, 1924 Budapest; ref. cit.), Gioseffi and Baichch (Reformia Medica, 21, 1924; ref. cit.), Rottini (La Pediatria, 1924; ref. cit.), Boisserie and LaCroix (La Art Medical, 6, 1924; ref. cit.), De Toni (Soc. de pediatrie de Paris, seanced u 17 fevrier, 1925; ref. cit.), Lazzarini (Policlinico, sez. prat., 17, 1925; ref. cit.), Pichezzi (Policlinico, sez. prat., 17, 1920; ref. cit.), Amenta (La Pediatria, 9, 1920; ref. cit.) and others refer to hundreds of children vaccinated with the Italian vaccine, who were exposed to scarlet fever in epidemics and yet nearly all of them remained well.

Di Cristina and Caronia (Archivio di Pediatria, 1, 1925; ref. cit.) report 6000 children protected by their vaccine and exposed to scarlet and only two per cent contracted the disease. In some cities of Europe, notably Trieste, all susceptible school children as determined by Di Villa's intradermal test, are protected by the Italian vaccine. The method of preparing their vaccine is given. Often a single injection, usually intravenously suffices to protect.

Caronia (La Pediatria, 3, 1925; ref. cit.) states that transient fever, chills and cold extremities sometimes follow the vaccine injections. When vaccine is used for treatment there is prompt improvement; few or no complications result.

Ranchi, Sabatini and Cartia (La Pediatria, 3, 1923; ref. cit.) examined the blood of six patients for power to deviate complement, of agglutination and of phagocytic activity and leucocytic content. All these agencies are of increased activity after the use of the vaccine.

A. Nastasi, (Pediatria, Naples, Jan. 1, 1926; abstr. J. A. M. A. LXXXVI, p. 726) found Caronia's organisms in serum of 14 cases of post-scarlatinal nephritis but no streptococci.

Herderschee (Nederlandsch Tijdschrift v. Geneeskunde, Amsterdam, Dec. 5, 1925, p. 2548; abstr. J. A. M. A. LXXXVI, p. 522) presents evidence which suggests that another factor than hemolytic streptococci may be active in the causing of scarlet fever. A filterable virus may sensitize for the streptococci. He suggests that a close study on this point may be made in scarlet, chicken pox and the lesions of burns. In the last year he has had 30 cases of varicella to show a scarlatina a day or two after the appearance of the eruption.

THE CANCER QUESTION

Statement of the Facts and Opinions Agreed to by the International Meeting on Cancer Control Held at Lake Mohonk, N. Y., September 20-24, 1926.

The Symposium on Cancer Control held at Lake Mohonk, N. Y., September 20-24, under the auspices of the American Society for the Control of Cancer, resulted in a concise statement of facts and opinions which should have a profound effect upon the handling of cancer patients. This meeting was for the purpose of considering the prevention and cure from a practical standpoint and to express in concise language the fundamental groundwork of fact and opinion upon which the collective effort now being made in the United States and other countries for the control of cancer should be continued and extended.

It was believed that there were many things which physicians and surgeons could agree upon, and that if these agreements could be expressed in simple, concise language the results would be of much value. The statement issued is as follows:

"Although the present state of knowledge of cancer is not sufficient to permit of the formulation of such procedures for the suppression of this malady as have been successfully employed for the control of infectious diseases, there is enough well established fact and sound working opinion concerning the prevention, diagnosis and treatment of cancer to save many lives, if this information is carried properly into effect.

1. The causation of cancer is not completely understood, but it may be accepted that for all practical purposes cancer is not to be looked upon as contagious or infectious.

2. Cancer itself is not hereditary, although a certain predisposition or susceptibility to cancer is apparently transmissible through inheritance. This does not signify that, because one's parent or parents or other members of the family have suffered from cancer, cancer will necessarily appear in other persons of the same or succeeding generation.

3. The control of cancer, so far as this subject can be understood at the present time, depends upon the employment of measures of personal hygiene and certain preventive and curative measures, the success of which depends upon the intelligent cooperation of the patient and physician.

4. Persons who have cancer must apply to competent physicians at a sufficiently early stage in the disease, in order to have a fair chance of cure. This applies to all forms of cancer. In some forms early treatment affords the only possibility of cure.

5. Cancer in some parts of the body can be discovered in a very early stage, and if these cases are treated properly the prospect for a permanent cure is good.

6. The cure of cancer depends upon discovering the growth before it has done irreparable injury to a vital part of the body and before it has spread to other parts. Therefore, efforts should be made to improve the methods of diagnosis in these various locations and the treatment of the cancers so discovered.

7. The public must be taught the earliest danger signals of cancer which can be recognized by persons without a special knowledge of the subject, and induced to seek competent medical attention when any of these indications are believed to be present.

8. Practitioners of medicine must keep abreast of the latest advances in the knowledge of cancer in order to diagnose as many as possible of the cases of cancer which come to them.

9. Surgeons and radiologists must make constant progress in the refined methods of technic which are necessary for the diagnosis and proper treatment not only of ordinary cases but of the more obscure and difficult ones.

10. There is much that medical men can do in the prevention of cancer, in the detection of early cases, in the referring of patients to institutions and physicians who can make the proper diagnosis and apply proper treatment, when the physicians themselves are unable to accomplish these results. The more efficient the family doctor is, the more ready he is to share responsibility with a specialist.

11. Dentists can help in the control of cancer by informing themselves about the advances in the knowledge of the causes of cancer, especially with relation to the irritations produced by imperfect teeth and improperly fitting dental plates. They can also help by referring cases of cancer

which they discover to physicians skilled in the treatment of cancer in this location. It may be doubted whether all dentists fully realize the help which can be obtained from x-ray photographs in revealing not only the state of the teeth but the condition of the bone surrounding them.

12. Medical students should be instructed in cancer by the aid of actual demonstrations of cancer patients, and this to a sufficient extent to give them a good working knowledge of the subject.

13. The most reliable forms of treatment, and, in fact, the only ones thus far justified by experience and observation, depend upon surgery, radium and x-rays.

14. Emphasis should be placed upon the value of the dissemination of the definite, useful and practical knowledge about cancer, and this knowledge should not be confused nor hidden by what is merely theoretical and experimental.

15. Efforts toward the control of cancer should be made in two principal directions: (1) the promotion of research in order to increase the existing knowledge of the subject, and (2) the practical employment of the information which is at hand. Even with our present knowledge many lives could be saved which are sacrificed by unnecessary delay.

BOOK REVIEWS

THE ART OF MEDICAL TREATMENT. By Francis W. Palfrey, M. D., Visiting Phyisican, Boston City Hospital; Instructor in Medicine, Harvard University. Octavo of 463 pages. Philadelphia and London; W. B. Saunders Company, 1925. Cloth $4.50 net.

This is rather a small volume of 453 pages. Nearly every medical ailment receives attention. A few diseases such as tularemia, Vincent's angina and pulmonary spirochetosis are omitted. In same cases the discussion is too brief to be useful.

However, the important diseases met in general practice are fully considered and the measures outlined are such as are in routine use in the best hospitals, especially those of Boston.

No references are given, which is a mistake, because one will generally need to pursue the subject farther except in simple and typical cases. As a work for quick reference it will fill a real want.

There is danger of the book falling into the hands of the laity and other unqualified persons and being used without adequate diagnosis. Each subject has a paragraph on "information" which the average layman might read with great benefit. This knowledge might be of use to the young physician in some ways.

Each subject is considered under such heads as first thoughts, placing, diet, remedial, supportive, palliative, minor care, nursing, and finally information. This aids ready reference.

G. W.

A TEXT-BOOK OF MEDICAL DIAGNOSIS. By James M. Anders, M. D., Professor of Medicine, Medico-Chirurgical College, Graduate School of Medicine, University of Pennsylvania; and L. Napoleon Boston, M. D., Associate Professor of Medicine, Graduate School of Medicine, University of Pennsylvania. Third Edition, Entirely Reset. Octavo of 1422 pages, 555 illustrations, some in colors. Philadelphia and London; W. B. Saunders Company, 1925. Cloth, $12.00 net.

Anders and Boston's Medical Diagnosis is a familiar volume. The present edition comprises 1366 pages, and is a veritable dictionary of medical knowledge. Over 50 new subjects have been introduced, and we are told that the whole work has been rewritten.

Under tularemia we are disappointed in not seeing mention of Dr. Ancil Martin, of Phoenix, Ariz., the "father of tularemia." Under blastomycosis only the pulmonary form is discussed, though in the southwest the generalized forms are quite common. Nothing is said of coronary thrombosis in the discussion of cardiac rupture. These are minor defects. Space will not permit mention of the many commendable features of the book, its many excellent illustrations, the general conservative and sane attitude on all subjects.

For a work of ready reference it is most valuable. The specialist will find enough to direct his search to more complete knowledge in special monographs, and recent articles in the literature.

G. W.

DEVELOPMENT OF OUR KNOWLEDGE OF TUBERCULOSIS; by Lawrence F. Flick, M. D., LLD; Philadelphia; Wickersham Printing Co., Lancaster, Pa. Price $7.50.

When the reviewer was first handed this book he expected to find a detailed account of all of the facts, accumulated to date, on the subject of tuberculosis. This, however, is not the purpose of the book. It might be better were the book entitled "Historical Survey of Tuberculosis" for such it really is.

It is a most interesting account of the theories of, and in the main, feeble attempts to understand, tuberculosis.

Of course the wonderful work of Koch, of Villemin, of Virchow, of Louis, of Skoda, of Laennec, of Bayle, of Baillie, of Stark, of Auenbrugger, are detailed and given the prominence they rightfully deserve. In nearly every instance these great pieces of work were either not noticed, ignored or bitterly criticised; and usually it was the latter. But thus it has ever been.

There are many quotations nicely selected. The stories are interestingly told. There are a few typographic errors. For example on Page 680, in foot note, in General Sternberg's name the letter "n" is omitted. On page 52 in tenth line from the bottom the word "an" is used where "on" was obviously intended.

The pages are well printed and bound. One splendid feature is the light weight. There are nearly 800 pages in the book; it is nearly 2½ inches thick, by the usual dimensions otherwise; and yet it is lighter to hold than many books one-third its size.

O. H. B.

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Southwestern Medicine

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Medical and Surgical Association of the Southwest

Twelfth Annual Meeting, Tucson, Arizona, November 11-13, 1926

The twelfth annual session of the Medical & Surgical Association of the Southwest will meet in Tucson, Arizona, November 11, 12 and 13.

This should be sufficient announcement to cause one hundred doctors of New Mexico, Arizona, western Texas and northern Mexico, immediately to wire Dr. Ira E. Huffman, Tucson, Ariz., to make reservations for them at the Tucson hotels for those dates. If further inducement is needed, a perusal of the program printed herein, should add the finishing touch. The Pima County Medical Society, fearing that they might not be able to furnish as elaborate a clinical program as desired, has arranged to give up a portion of each forenoon to the General Session, with the request that the Program Committee secure some prominent outside speakers. This has been done, as inspection of the program will show.

Whatever Tucson may lack in the way of clinical material, will be more than made

Of special scientific interest is the Carnegie Desert Biologic Laboratory, whose elevated location gives an excellent view of the Santa Cruz Valley. (Courtesy "Progressive Arizona").

up in entertainment. The Old Pueblo Club and the Tucson Country Club, with its excellent golf course, will be open to the members and guests of the Association. There are many nearby points of historical and scientific interest, including the San Xavier Mission, the Carnegie Desert Laboratory, the University with its famous Observatory and other buildings. Whatever time can be spared from the program can be very profitably and enjoyably spent in visiting these points.

The two general hospitals are well equipped and the clinics will be given in the early forenoons of the three days. Announcement cannot now be made about the clinical program, because this will depend on the material available at the time. St. Mary's Hospital and the Arizona Hospital each has excellent and modern surgical facilities, with all departments well organized. In addition, there are several tuberculosis sanatoria, including the U. S. Veterans' Bureau Hospital and the new Desert Hospital.

The Santa Rita Hotel will be the Association headquarters. The Chairman of the Committee on Hotel Accommodations is Dr. Ira E. Huffman, 123 S. Stone Ave., Tucson, Ariz. Reservations should be made either through him or direct to the hotel as early as possible, as Tucson has limited accommodations during the winter season.

Desert Sanatarium (under construction), where every modern means of utilizing heliotherapy in tuberculosis will be used.
(Courtesy Tucson Chamber of Commerce).

San Xavier Mission, Tucson; one of the scenic and historical attractions of the Southwest.
(Courtesy Tucson Chamber of Commerce).

PROGRAM

THURSDAY, NOVEMER 11, 1926

Clinics at Hospitals: 7:30 to 9:30 a. m. (For schedule secure information at Registration Desk in Santa Rita Hotel).

MORNING SESSION

Scottish Rite Temple, 10 A. M.

Invocation:
REV. R. S. BEAL, Pastor First Baptist Church.

Addresses of Welcome:
For City of Tucson:
MAYOR JOHN E. WHITE.

For Pima County Medical Society:
DR. W. V. WHITMORE.

Rosponse for the Association:

.....

10:20—DR. PAUL GALLAGHER, El Paso, Tex. *"Gall Bladder Studies."*

10:40—DR. H. D. GARRETT, El Paso, Texas: *"Chronic Pancreatitis."*

Discussion: DR. S. C. DAVIS, Tucson.

11:20—DR. ORVILLE H. BROWN, Phoenix: *"Cardiac Efficiency."*

11:40—DR. G. WERLEY, El Paso, Texas: *"The Problem of Coronary Sclerosis."*

Discussion: DR. F. T. FAHLEN, Phoenix.

AFTERNOON SESSION

SCOTTISH RITE TEMPLE

SESSION ON TUBERCULOSIS

1:45—DR. M. POLLAK, Kittredge, Colo.: *"The Educational and Social Management of Tuberculosis."*

2:10—DR. VICTOR RANDOLPH, Phoenix: *"Treatment of Pulmonary Hemorrhage."*

2:30—DR. JOHN W. FLINN, Prescott, Ariz. *"The Epitheloid Cell in Tuberculosis."*

2:50—DR. T. T. CLOHESSY, Phoenix, Ariz. *"Tuberculosis of the Skin."*

3:10—DR. EDGAR H. BROWN, Phoenix, Ariz. *"Tuberculosis of Bone."*

3:30—DR. ORVILLE EGBERT, El Paso, Texas: *"The Comparative Value of Natural and Artificial Lights."*

3:50—DR. FELIX P. MILLER, El Paso, Tex.: *"Lung Surgery."*

Discussion to be opened by DR. S. H. WATSON, Tucson; DR. BERNARD L. WYATT, Tucson; DR. C. E. YOUNT, Prescott.

EVENING SESSION

7:00—Informal Smoker, Santa Rita Roof Garden.

8:30—President's Address: DR. WILLARD SMITH, Phoenix, Ariz.

DR. J. G. WILSON, U. S. Public Health Service: *"Investigation of Diarrhoeal Diseases in New Mexico."*

FRIDAY, NOVEMBER 12, 1926

7:30 to 9:30 a. m., Clinics at Hospitals

MORNING SESSION

SCOTTISH RITE TEMPLE

10:00—DR. HUGH CROUSE, El Paso, Texas: *"Character of Gastric Ptosis Suitable for Surgery."*

Discussion opened by DR. J. I. BUTLER, Tucson.

10:45—DR. HARRY LEIGH, El Paso, Texas: *"Laryngeal Obstruction."*

Discussion opened by DR. ALVIN T. KIRMSE, Tucson.

11:40—DR. FRANK J. MILLOY, Phoenix: *"Effect of Menstruation on Basal Metabolism."*

Discussion: DR. I. E. HUFFMAN, Tucson.

AFTERNOON SESSION
SCOTTISH RITE TEMPLE

SESSION ON INDUSTRIAL MEDICINE AND SURGERY

1:40—DR. S. D. SWOPE, Chihuahua, Mexico: *"Medical and Surgical Service in the Industrial World."*

2:00—DR. W. H. WOOLSTON, Albuquerque, New Mexico: *"Infections of the Hand."*

2:20—DR. R. L. RAMEY, El Paso, Texas: *"General Outline of Treatment for Certain Fractures of Arm."* (x-ray demonstration).

2:40—DR. JOHN E. BACON, Miami, Ariz.: *"The Management of Back Injuries."*

3:00—DR. WM. A. SCHWARTZ, Phoenix: *"Copper Foreign Bodies in the Eye."*

3:20—DRS. FRANK and S. A. SCHUSTER, El Paso, Texas: *"The Labyrinth in Head Injuries."*

Discussion of Industrial Symposium to be opened by DR. F. T. WRIGHT, Douglas; DR. GEORGE A. BRIDGE, Bisbee; DR. B. F. MORRIS, Tucson.

4:30—DR. P. R. CASELLAS, El Paso, Texas: *"Information the Clinician Owes the Roentgenologist."*

Discussion: DR. J. L. MCKNIGHT, Tucson, Arizona.

SATURDAY, NOVEMBER 13, 1926

7:30 to 9:30 a. m., Clinics at Hospitals.

MORNING SESSION
SCOTTISH RITE TEMPLE

10:00—DR. J. C. MASSON, Mayo Clinic, Rochester, Minn.: *"Total Abdominal Hysterectomy vs. Subtotal."*

10:30—DR. W. L. BROWN, El Paso, Texas: *"A Plea for the More General Use of the Duodenal Tube in Pre- and Post-Operative Cases."* (Lantern Slides).

Discussion: DR. GEORGE GOODRICH, Phoenix.

11:00—DR. E. C. MATHEWS, Albuquerque, New Mexico: *"Accessory Sinusitis in Childhood."*

Discussion opened by DR. M. C. COMER, Tucson.

11:30—DR. JAMES VANCE, El Paso, Texas: *"Treatment of Suppurative Peritonitis."*

Discussion: DR. MEADE CLYNE, Tucson.

AFTERNOON SESSION
SCOTTISH RITE TEMPLE

SESSION ON UROLOGY

1:30—DR. H. C. BUMPUS, JR., Mayo Clinic, Rochester, Minn.: *"Stones of the Ureter; Their Etiology, Diagnosis and Treatment."*

2:00—DR. BURNETT W. WRIGHT, Los Angeles, Calif.: *"Stones in the Urinary Tract,"* (Lantern Slides).

2:20—DR. KELVIN D. LYNCH, *"Non-Calculus Ureter Obstruction."*

2:40—DR. W. L. JAMIESON, El Paso, Tex.: *"Pyelitis of Pregnancy."*

3:00—DR. CHARLES S. VIVIAN, Phoenix: *"Urologic Diagnosis."*

Discussion to be opened by DR. W. C. SCHULTZ, Tucson; DR. J. B. LITTLEFIELD, Tucson.

BUSINESS SESSION

3:40—General Business Session.

Election of Officers.

GOOD LOCATION IN NEW MEXICO

A doctor in one of the prosperous communities in New Mexico wishes to secure an assistant with the idea of forming a partnership if the association proves satisfactory. The doctor has a large general practice and does his own surgery. About half the population is Spanish and it is very desirable that the assistant speak this language.

This is an excellent opening. Inquiries may be addressed through Box 1587, Phoenix, Ariz.

SOUTHWESTERN SURGICAL SUPPLY CO. OPEN STORE IN PHOENIX

The medical profession of Arizona will be interested in the announcement of a surgical supply store being established in Phoenix. The Southwestern Surgical Supply Co. of El Paso have established a branch store at No. 11 North Third Ave., Phoenix, with a complete stock of surgical instruments and hospital supplies. This concern is the agent in this territory for a number of manufacturers and expect to give service in x-ray and physiotherapy equipment. Mr. Rease Littlefield will be in charge of the branch store and one of the firm members will also be in attendance most of the time.

DR. ALEMBERT W. BRAYTON

The death of Dr. Alembert W. Brayton, of Indianapolis, will be noted with regret and sorrow by more than one physician in Arizona. As the father of Dr. Nelson D. Brayton, of Miami, his passing is of interest to the medical profession of the state. Dr. Brayton was an eminent authority on dermatology, having occupied the chair in this specialty in the Indiana Medical College for more than forty years. In addition to Dr. Nelson D. Brayton, another son, Dr. Frank A. Brayton, of Indianapolis, with seven other children survive their father. Among the former pupils of Dr. Brayton, now living in Arizona, are Dr. H. K. Beauchamp of Phoenix and Dr. Chas. I. Irvin of Miami.

CALUMET HOSPITAL IN DOUGLAS CHANGES MANAGEMENT

A transaction of interest in the medical profession of the state was the transfer of the ownership and management of the Calumet Hospital in Douglas, on September 30th, from Dr. F. T. Wright to Dr. E. W. Adamson. This is one of the oldest hospitals in Arizona, being opened in 1903 by Dr. Wright, primarily for the industrial work of the Calumet & Arizona Mining Co. It has been in charge of Dr. Wright con-

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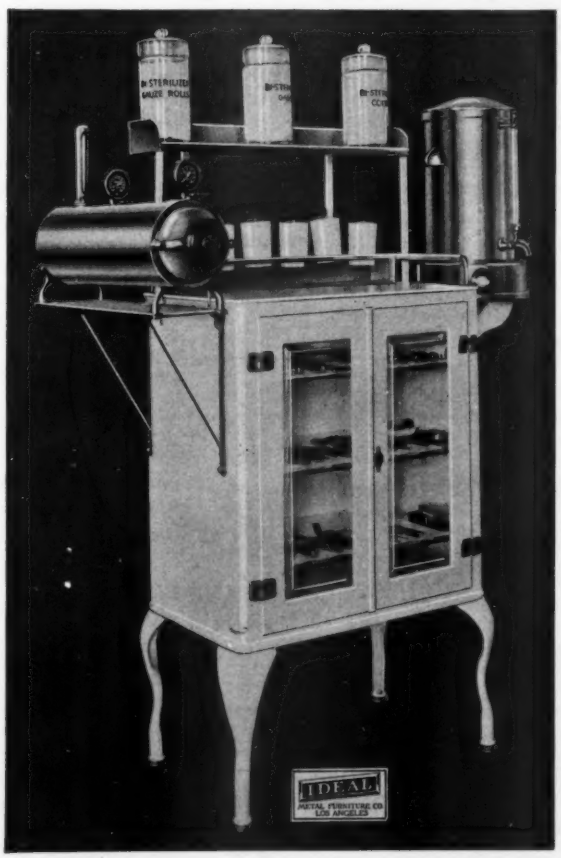
tinuously since that time, Dr. Carl H. Lund being associated with him since 1912. The hospital has been enlarged from time to time, until its original capacity of ten beds has been increased to twenty-five. Dr. Wright, after a long and fruitful service in practice extending over nearly thirty years, will retire. It will be a pleasant announcement to the profession of Arizona to learn that he will make his home in Douglas. Dr. Lund also retires from the hospital staff, but will remain in practice in Douglas.

Dr. E. W. Adamson, who assumes charge of the Calumet Hospital, is also very well known throughout the southwest. He located in Arizona in 1905, practically all of his work being done in Cochise County. His surgical work, during the many years of practice in Douglas, has usually been performed in the Calumet Hospital, and he was in charge of the institution during periods when Dr. Wright would be away. Associated with Dr. Adamson in the hospital will be Dr. H. M. Helm, formerly of Nacozari, Mexico.

PERFECT AND RAPID STERILIZATION BY NEW PROCESS



An entirely new method which permits of the easy sterilization of all instruments, materials, dressings, etc. Cystoscopes, electric lighted instruments and delicate cutting instruments can be sterilized for the first time under pressure in 3 minutes time, without injury to the instrumen s or material.

SIMPLE—SAFE—EFFECTIVE. Operates on an entirely new princ ple. Will positively sterilize any instrument, material or dressing in the minimum of time and without the slightest injury. Practically automatic in operation. Very economic to maintain. Not an experiment, its mtrit has been proven by practical usage for a period of years and numerous bateriological tests.

The sterilizer is electrically heated, made for either alternating or direct currents, and the heat theromstatically controlled.

The solution used in this sterilizer is ethyl alcohol, and where quicker sterilization is desired add 2% formaldehyde.

The results proven by hundreds of tests show the following:

Anthrax Spores—killed in from 5 to 8 minutes at 10 pounds pressure, with a charge of 2% formaldehyde in 95% alcohol.

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Anthrax Spores—killed in 5 minutes at 15 pounds pressure, with a charge of 95% alcohol.

Streptococci and Staphylococci—each killed in one minute at 10 pounds pressure, with a charge of 2% formaldehyde in 95% alcohol.

Streptococci and Staphylococci—each killed in 2 minutes at 10 pounds pressure, with a charge of 95% alcohol.

(Above tests made by Drs. Brem. Zeiler & Hammack Laboratory, Los Angeles, Cal., for Dr. Hollenback.)

Construction of brass, bronze and heavy copper throughout, fully nickel plated.

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THE ITALIAN CLAIMS VS. THE AMERICAN CLAIMS ON THE PROBLEMS OF SCARLET FEVER.

We who have been reading the American literature only, on scarlet fever, have almost invariably arrived at the conclusion that the last word has been said on the subject. No less an authority than E. C. Rosenow wrote in January of this year, "Indeed, the problem of scarlet fever seems solved." Surely we all have felt the same.

Those who have read the Italian literature know that while the Italian physicians are thoroughly aware of the American work, they do not believe this work totally explains scarlet fever. As a matter of fact, as will be seen by the study of the review of Italian literature given in other columns, the Italian school has found a bacterium of different characteristics which they claim to be the cause of scarlet fever. They find this organism in all cases of scarlet fever up to the stage of convalescence and in all complications. They gather it from the blood, the bone marrow, the spinal fluid, the urine if nephritis exists, suppurating ears and other complications. They duplicate nearly all, if not all, the results with their cultures which the Dicks, Dochez and others have been able to obtain with the hemolytic streptococci, which the Americans believe to be the cause of scarlet fever.

The Italians, as well as the Americans, are serious minded, conscientious physicians. The work of neither group can be ignored. By virtue of the fact that the streptococcus hemolyticus has for many years been regarded as the etiologic agent of scarlet fever the Americans would appear to have an advantage in the argument. Scientific discovery, however, sometimes plays queer tricks.

There must be some way whereby the work of the Italians and that of the Americans can be reconciled. Theorizing may be simply a waste of time and paper, but on the other hand it may lead somewhere. What are the apparent possibilities?

In the first place either or both explanations may possibly be wrong. With the vast amount of work which appears to support them it would seem that neither can be much wrong. Can they both be right?

Suppose both are working with the same organism under different cultural conditions. The family of streptococci have time and again proven to have bizarre manifestations. It just might be possible that

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Shad Scale (Atriplex canescens)	March - June
Rabbit Bush (Franseria deltoidea)	April - May
June Grass (Blue Grass, Poa pratensis)	May - Sept.
Bermuda Grass (Capriola dactylon)	May - Sept.
Johnson Grass (Sorghum halepense)	June - Oct.
Annual Saltbush (Atriplex Wrightii)	July - Sept.
Redroot Pigweed (Amaranthus retroflexus)	July - Sept.
Sage Brush (Artemisia tridentata)	July - Sept.
Cocklebur (Xanthium canadense)	July - Sept.
Russian Thistle (Salsola pestifer)	July - Sept.
Careless Weed (Amaranthus palmeri)	July - Oct.
Slender Ragweed (Franseria tenuifolia)	Sept. - Oct.

PROCEDURE

FIRST, determine when the patient suffers an attack and apply skin tests with pollens of plants causing Hay-Fever at that period.

SECOND, from the resulting reactions determine the antigen that should be used for desensitizing. Several skin tests may be made at one time. Positive tests resulting from plants that pollinate at periods when the patient does not suffer may be entirely disregarded, as the patient is able, without aid, to overcome this sensitiveness.

TREATMENT

Where several reactions of equal intensity are recorded the use of the **Spring Type Antigen** is recommended for persons whose hay-fever symptoms occur from the latter part of April to the first of August and **Individual Antigen** is recommended for persons whose hay-fever symptoms occur from August first to frost in October.

Diagnostic Assortment No 5 ..... **Gratis**

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PHOENIX, ARIZONA.

the Italians are working with another form or strain of the one the Americans are claiming is the cause of scarlet fever. We must admit, however, that this seems foolish.

It might be possible that scarlet fever is not the same disease in Italy that it is in America. This, too, seems unlikely.

Symbiotic organisms are sometimes responsible for disease. It might, we suppose, be the case with scarlet fever. Dicks' filtrate might be a pure culture of a filterable virus. This has already been partly suggested by Gorter and DeKorte of Holland. This explanation does not seem likely.

More work remains to be done upon the problems of scarlet fever. If DiCristina and Caronia could send competent attaches of their laboratories to America to work with Dick, Dochez, Zingher and others, and let these American researchers on scarlet fever reciprocate with representatives of their laboratories to work with the Italians who are investigating scarlet fever, the argument might be speedily settled.

O. H. B.

SANTA FE COUNTY MEDICAL SOCIETY

A symposium on bacillary dysentery took up the regular September meeting of the Santa Fe County Medical Society, which was held at St. Vincent Sanatorium, Tuesday evening, September 14. The program was arranged by the president, Dr. D. B. Williams.

After a brief summary of the condition, with essential symptoms, by Dr. Leigh K. Patton, and a discussion of the clinical picture of epidemic diarrhea as it occurs yearly in Santa Fe, by Dr. Robert O. Brown, the laboratory diagnosis was presented by Mrs. E. M. A. Enlows, Ph. D., of the U. S. Public Health Service.

Mrs. Enlows described the three procedures generally used in differentiating bacillary conditions in the bowel: fermentation, agglutination, microscopic examination of slides made from the stool direct. She exhibited fuchsin plates, showing how the Gram-positive bacilli are differentiated; and she also brought test tubes containing agglutination tests, by which typhoid fever may be ruled out, and the infections from the Shiga and the Flexner bacilli differentiated. In the Philippines, diagnosis is almost wholly by slide examination. Many times it is impossible to get positive cultures from the stools of infected people. In the present survey nine patients yielded positive cultures of the Flexner bacillus, and one at Zuni produced the Shiga bacillus. It was also noted that the epidemic at Zuni was severer than elsewhere, with several deaths due to the infection.

Dr. J. G. Wilson, also of the Public Health Service, talked on the prevention and treatment of the dysenteries. As infection is by contact, patients should be isolated and their dejecta protected as in typhoid fever. Food, milk, and water should be eliminated as causes of infection. Convalescents and possible carriers should be watched, especially if they be food handlers. Flies, the most probable source of dissemination, should be destroyed so far as possible, and screened out.

While some beneficial results have been obtained by the use of a "polyvalent" anti-dysenteric serum, it is desirable to prepare a serum for each locality, from the organisms recovered there. This may be used in large doses, preferably per rectum in 200-300 c. c. amounts. Fluids should be given in large quantities to combat the dehydration—saline infusions, liquids per mouth. Colonic irrigation with saline is valuable. Saline purges or castor oil may be used to free the bowel of infected matter. Bismuth carbonate or subgallate and rhubarb (in children) are valuable as drugs. The diet should be bland and non-irritant.

Dr. Wilson said that the results of the investigations made this summer do not justify any statement as to the definite cause and transmission of this summer diarrhea. He hopes to be able to carry out the same investigations through successive summers. The epidemic of 1926 has been mild as compared with that of 1925, which caused the New Mexico Bureau of Public Health to appeal to the U. S. Public Health Service for aid, and resulted in this survey. Dr. Wilson declared that much valuable information has been secured to serve as a basis for future work, and he thanked the Santa Fe physicians for their support and cooperation during his investigation.

In connection with the mild epidemic of this summer, it was noted that the flies have been noticeably less in number. Attempts to trap flies for enumeration have met with very slight results. Water may be practically set aside as a cause of transmission.

Dr. George Luckett, Director of Public Health for New Mexico, announced that he intends to ask the Public Health Service to continue its in-

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vestigation of this topic during successive years. The society gave a vote of thanks and appreciation to Drs. Wilson and Enlows for their work here.

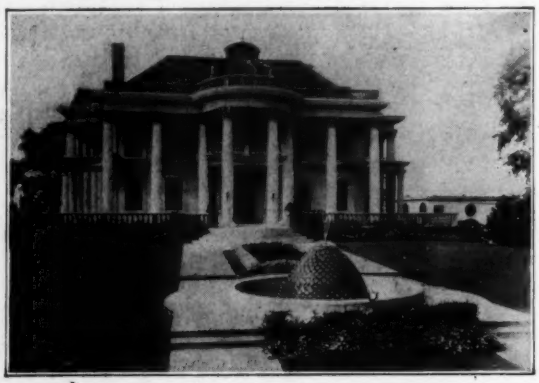
Ten members of the county society were present, with the vice-president, Dr. Joseph Foster, in the chair. Visitors were Dr. Joseph M. Patton, of Chicago, Dr. Sarah L. Norton, of Columbus, Ohio, Dr. William Leming and Miss Ruth Marlin, R. N., both of Santa Fe.

MARICOPA COUNTY MEDICAL SOCIETY
(Phoenix, Ariz.)

The fall meetings of the Society were resumed on October 2nd, the first meeting being held on that date with thirty-eight members and four visitors present. The meeting was held in the Directors' Room at the Arizona Deaconess Hospital.

By motion, the reading of the minutes was dispensed with.

Privilege of the floor was extended to Mr. J. R. Jennings, State Dairy Inspector, who spoke about a recent article appearing in a daily newspaper of Phoenix, extolling the virtues of raw milk and warning against the use of pasteurized milk. Mr. Jennings had prepared a statement in reply to this article and wished to have the approval of the County Medical Society, before printing his reply. His reply consisted chiefly of quotations from recognized authorities in public health, which explained the advantages of pasteurized milk and the dangers of raw milk. The Society voted approval of his article.



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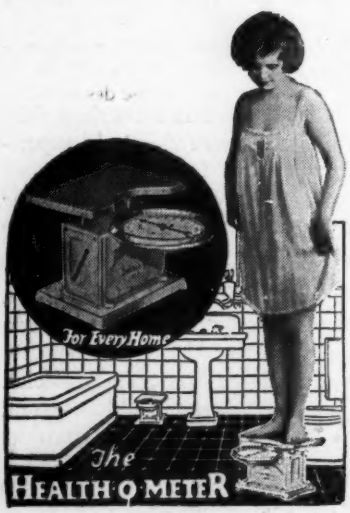

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The names of Drs. T. E. Schwarz of Phoenix, R. L. Penn of Lichton, Bernard L. Melton of Phoenix and E. L. Christensen of Phoenix were presented as applicants for membership, with the approval of the Board of Censors. They were unanimously elected to membership.

Dr. T. E. Schwarz, Chairman of the General Committee on Examination of Children, reported on the progress of the work and the plans of the committee for this campaign.

Dr. Mary L. Neff, of Los Angeles, a visitor, reported a case of electric shock which recovered, giving the symptoms which the patient described; this was interesting as very few patients sustaining such shocks recover.

Dr. Harry R. Carson presented a paper on "The Evaluation of Surgical Risks from the Standpoint of the General Practitioner." This paper embraces the material issued by the National Anesthesia Association, with original comments by Dr. Carson from personal experience. It will be published in SOUTHWESTERN MEDICINE soon. Numerous charts were shown by lantern slide, to demonstrate the accuracy with which the surgical risk could be determined.

Dr. E. Payne Palmer opened the discussion, using a case recently operated, in which the surgical risk had been carefully determined by Dr. Milloy; patient was a woman with advanced tuberculosis, upon whom it became necessary to perform laparotomy. The surgical risk involved led to the use of local anesthesia, with a small amount of gas at one point in the operation. Gall-bladder was removed, along with a tuberculous appendix and small segment of tuberculous cecum.

Dr. A. M. Tuthill continued the discussion. He did not profess to know much about the methods described by Dr. Carson, but discussed in a general way the value of ascertaining surgical risks.

Dr. Goodrich did not think it necessary to make such tests as described by Dr. Carson on every patient undergoing major surgery.

Dr. Harbridge discussed the historical features of anesthesia, with special reference to the general recognition now accorded Crawford W. Long, as the discoverer of ether anesthesia.

Dr. Watkins commented on the title of the paper and expressed his belief that the surgical risk of a patient referred for operation should be determined by the family physician. Under ordinary conditions a surgeon,—unless he is also the family physician,—does not have the oportunity to study the patient which is enjoyed by the family physician. The doctor who has known a patient as family doctor, perhaps has attended him through other illnesses, and can evaluate the "whole patient" rather than a single lesion, which the surgeon sees, can best determine the surgical risks involved in any operation. After this has been determined, the patient can then be referred for surgery to the surgeon of choice.

Dr. Carson closed the discussion by emphasizing the importance of routine application of the recognized tests described by him. He recalled a report by a dentist who uses the breath holding test as a ready means of determining whether his patients can safely take gas anesthesia. In a series of fifty patients thus tested he found two apparently healthy people to whom it would have been dangerous to give gas anesthesia.

Dr. Frank J. Milloy presented a paper on "Gall Bladder Disease." The discussion of this paper was deferred until the next meeting, owing to the lateness of the hour.

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ST. JOSEPH'S HOSPITAL (Phoenix) MONTHLY STAFF MEETING FOR SEPTEMBER

The Medical and Surgical Staff of St. Joseph's Hospital (Phoenix) resumed its monthly meetings, after the summer recess, on September 18th, with twenty-four members and two of the Sisters present. Dr. Win Wylie, chairman, presided.

CASE 1. RUPTURE OF GALL BLADDER
(Discussed by Dr. Louis Dysart.)

Married woman, age 62.

Entered April 26th. Past History: was operated on for large cyst of ovary in June, 1923, in this hospital. In 1880 had malaria followed by jaundice; gall-stone colic in 1909 without jaundice: again in 1925 had pain in gall-bladder region extending into back but no jaundice.

Present Complaint:—On April 17th, had severe pain in hypochondrium and epigastrium extending into back with fever up to 102.5 and chill. Jaundice on Apr. 20th which deepened; had little pain until she walked down stairs on Apr. 20th to come to hospital. Pain then became intense and lasted until abdomen was drained.

Phys. Exam.:—Deeply jaundiced; heart slow and at times skips a beat; great tenderness in epigastrium and right hypochondrium. Otherwise negative. White count 26,800; 96 per cent polys.

Operation:—Laparotomy. Bile was seen through peritoneum and was found free in abdominal cavity, but no evidence of peritonitis; large rent in lower surface of gall-blader; no stones or evidence of malignancy found. Drainage.

April 27th:—Had fairly comfortable night, except for position (prone). Much bile on dressings. Maximum temp. 99.6.

April 28th:—Resting fairly well, but weak. Temp. 100.

April 29th:—Feels very weak; much bile on dressings; no pain or tenderness; abdomen soft; drainage tube shortened. Maximum temp. 98.6.

April 30th:—No coherent response to questions; breathing shallow, heart slow and B. P. too low. Dr. Bannister, in consultation, notes that in his opinion coma is due to cholemia and there is little hope for recovery.

Patient continued in coma which gradually deepened and she died on May 5th.

Autopsy:—The body had been embalmed. Intestines punctured by embalming needles. No evidence of peritonitis except along the upper surface of liver and around the gall-bladder. Gall-bladder had sloughed off; common bile duct was enlarged so as to admit little finger. About one and one-half inches above the ampulla was a large gall stone, one and a half centimeters in diameter.

DR. WYLIE:—I would have said from the history that this patient died of peritonitis; the autopsy disproved that.

DR. E. P. PALMER:—How long had this patient been jaundiced before operation? (Ans.: Six days.) So frequently these cases are jaundiced for quite a while and we get destruction of liver cells from back pressure, so that no matter what you do at operation or after operation they go ahead and die. Last spring, we had a case in which there had been back pressure caused by stone, for a long time, and the liver through compensation had almost ceased to secrete bile; I told the patient's wife that no matter what we did, the patient would die. One thing the profession does not recognize as much as it should, and that is that cholecystitis

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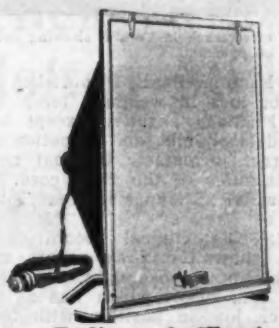

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is a surgical disease. In this case surgery had been advised before but refused.

NOTE ON CLINICAL RECORD:—This is a well kept record, with Personal History, Physical Examination, Working Diagnosis, Operative Record, Progress Record, Consultant's Notes, and Cause of Death all carefully charted. The question of peritonitis is answered by a Post Mortem Record, which ruled it out.

CASE 2: LINITIS PLASTICA
(History read by Secretary.)

Colored man, age 47, unmarried. Says he has always been strong and healthy until present illness. Entered Aug. 24th.

About a year ago began to have epigastric pain, with nausea and vomiting, which has been worse during past three months. Has had indigestion and loss of weight. For past six weeks has been annoyed with hiccoughs.

Radiograph of stomach in Case 2, showing extensive malignant disease of pylorus.

Phys. Exam.:—Poorly nourished (weight not stated, nor loss in weight); temp. normal; B. P. 120/70. Findings negative except for muscle defense and complaint on palpation over pylorus. Has indirect incomplete inguinal hernia on right with varicosities of the right cord.

Pre-operative Diagnosis:—Carcinoma of stomach.

(NOTE:—The clinical record in the hospital does not show the x-ray report made on Aug. 19th. This is an oversight, as the diagnosis is based on this report which was as folows:

"Stomach low in position with large defect involving entire pyloric end of stomach, lower margin especially being irregular and indented and lumen of this portion of stomach being markedly narrowed. Malignant newgrowth of stomach.")

(See figure.)

Operation:—Under local anesthesia, an incision ¾ in. to the left of midline, extending from the ensiform to a point one and a half inches below the umbilicus, was made. The stomach was brought into the wound and examined. Thirty c. c. of novocain were injected around the celiac axis and another 30 c. c. just to the right of the first lumbar. The stomach was found to be a typical so-called leather-bottle stomach. This was evidently a pathological condition of long stand-

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ing, as the vessels of the stomach had undergone considerable change. There was also complete obstruction at the pylorus, requiring removal of the major portion of the stomach. Enough of the stomach was left to contain about 3 oz. of fluid. The ileum was attached to this point by a two inch gastro-enterostomy operation and the abdomen was closed without drainage.

Post-operative Diagnosis:—Probably benign tumor of linitis plastica type.

Pathologist:—Portion of stomach wall much thickened and stiffened. Proliferating glandular structure, infiltrating submucosa and muscularis in long strands. Linitis type of stomach carcinoma. Wassermann negative.

Patient took water by mouth the day after operation; broth, fruit juices and cream on the second day, and left the hospital on the eighth day.

DR. GREER:—Just what was the type of growth found in this stomach?

DR. WATKINS:—The x-ray findings in this patient were quite characteristic of malignant newgrowth. The surgeons evidently were doubtful about malignancy on the gross appearance, because there was no tumor mass and no ulceration.

The term linitis plastica is very loosely used. It should be limited to the infiltrating scirrhous types of carcinoma, the fibrocarcinomas, infiltrating adenocarcinoma (as in this patient), or any type of carcinoma in which the newgrowth elements infiltrate the stomach wall, without forming tumor masses or ulceration. When so used, it means a malignant growth, and although of slow development and progress, is fatal. The cases which I can recall have all died.

DR. E. P. PALMER:—In 1918, we showed a case before the College of Surgeons meeting. This patient made a good recovery, after resection of stomach. Two years later she developed symptoms of cancer of the pelvic colon. Postmortem examination showed no evidence of recurrence in the stomach, but with a metastasis in the liver, of the same character as the colon growth, and both differing in type from the stomach tumor. We were of the opinion that these were independent growths.

CASE 3. RECTAL ULCERATION

Patient, married man, 47 years old, entered the hospital the first time March 13, 1924, with complaint of pain in rectum and bleeding. Patient a traveling salesman, of fair nutrition. Soft systolic murmur heard at apex only, not transmitted. Lungs negative. Enlarged prostate. Three large external hemorrhoids, and three internal bleeding hemorrhoids. Blood and pus cells in urine. Hemorrhoidectomy was done and patient discharged five days later (cured).

Patient re-entered just a year later, March, 1925, with proctitis which is stated to have resulted from previous complaint. Dilatation and cauterization performed. Many indolent ulcers with slightly undermined edges, grayish bases, and three fissures running out upon skin. Proctoscopic examination found nothing above the anus. Urine and blood count normal.

Patient remained in hospital a month and was discharged as "improved," but without definite statement on progress notes as to condition in rectum.

Patient re-entered in June, 1926, with working diagnosis of possible malignancy of rectum.

He has spent six months at Mayos since last entry, without diagnosis or improvement. No ameba were found; no tubercle bacilli; Wassermann negative. Rectum shows ulceration up as

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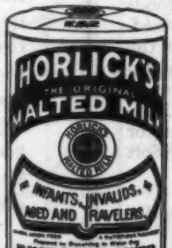

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RACINE, WISCONSIN

Importance of Knox Sparkling Gelatine in treating mal-nutrition ~ ~ ~ ~

PROVED!

—here is the official report from the Christian Herald Children's Home: ~

THIS is definite evidence of the protein value of Knox Gelatine, tested on a group of underweight children over a period of three weeks. The charts on the opposite page prove the protective colloidal ability of Knox Sparkling Gelatine in assisting weakened digestive organisms to assimilate all the nourishment of milk or other foods with which it is combined. After you have studied the charts, write us for authoritative data, including our special diet and recipe books, "Dietetically Correct Recipes for Diabetes," "Liquid and Soft Diets."

Knox Gelatine Laboratories
[illegible] Knox Avenue Johnstown, N. Y.

"The attached report of Dr. Andrew Blair, our consulting physician at the Children's Home at Mont-Lawn, New York, gives you in detail and chart form the results of using Knox Gelatine in the diet of the twenty-five (25) malnourished children under our care at the home from September 15th to November 15th, 1925.

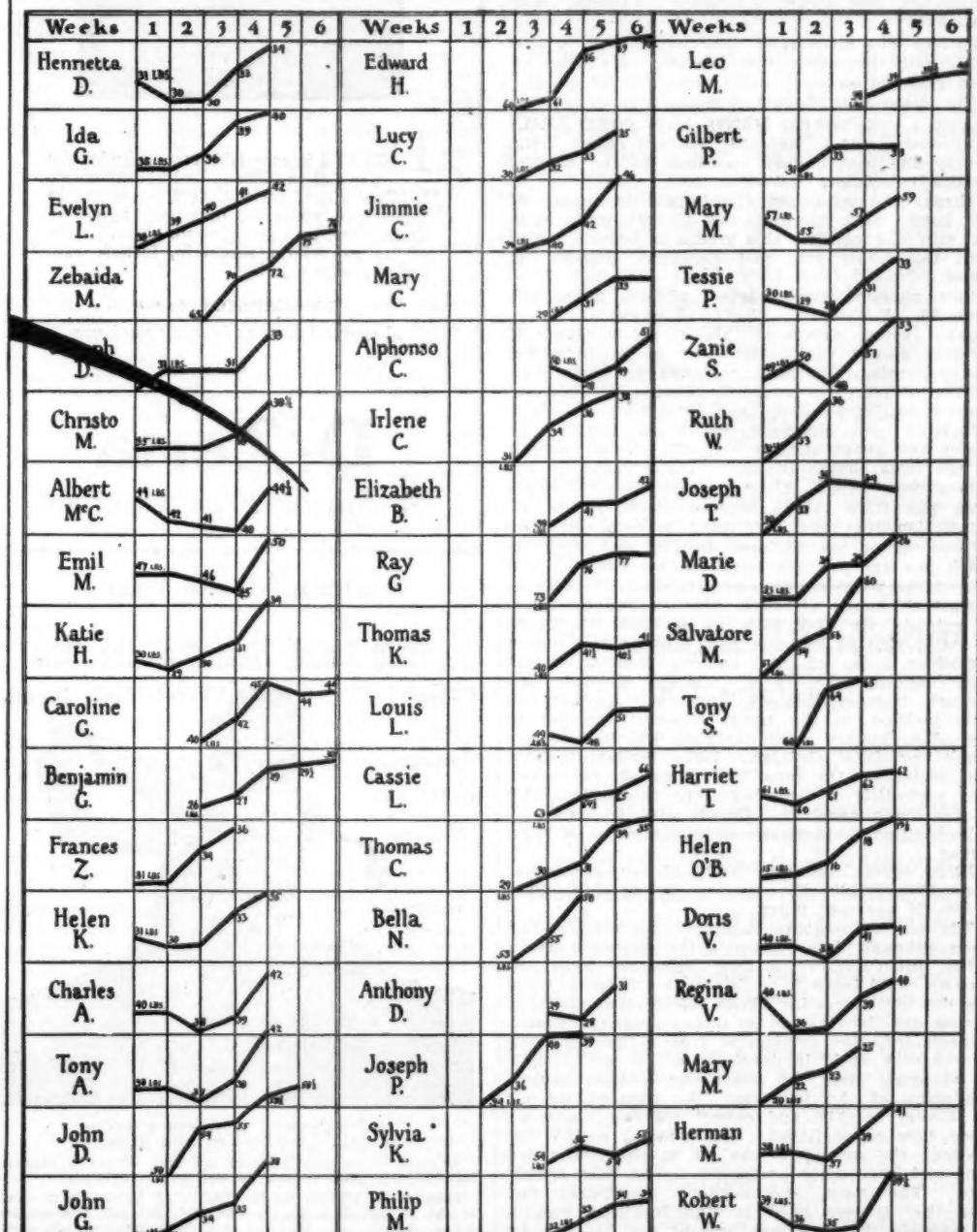
"You will be interested, too, in the remarkable change in all these children. The first week of the children's stay it was very difficult to feed them, the change of food, of course, had something to do with this, and their general condition. Each day thereafter we could notice first one, then another more anxious to find their places in the dining room, and ready for an extra helping, then look up at you so satisfied at the end of a meal, or tell you they had a good dinner or supper. Their attitude and outlook on life seemed to undergo a complete change mentally as well as physically.

"At first nothing interested them. With the gain in weight, though, came the added gain in mental activity and appreciation of life in general.

"From every standpoint it seems to me, and Dr. Blair's reports bear me out, that this experiment was one of the most successful we have conducted. I hope to be able to continue them next year, and with the experience gained make them even more profitable to those little mites who so sorely need this kind of human treatment."

(Signed) EMMA GOERING
Superintendent

Official Chart, showing weight gains made by children in *gelatine test!*



far as internal sphincter and extending upon the skin margin about half an inch. Dilatation of sphincter and cauterization of ulcer with actual cautery; section removed.

Pathologist's Report:—Sections show marked inflammatory changes with areas of necrosis. The surface of the tissue is covered with squamous epithelium showing moderate amount of proliferation but without atypical cell forms or marked infiltration into deeper structures. Probably non-malignant.

Patient was discharged after one month in hospital, with ulceration still present, but filling in with granulation.

(No discussion of this case.)

CASE 4. INFECTED HAND AND FORE ARM.

Married woman, age 38, entered April 25th. Family and past history recorded, but no bearing on this complaint.

Three days ago, had slight pain in thumb of left hand; next morning the fingers were swollen, stiff and painful; this gradually became worse until the whole arm and shoulders pained and ached.

Pale anemic woman, temp. of 102, pulse 120, resp. 28. Tongue dry; has had extensive dental repair; some pyorrhea; slight enlargement of cervical glands each side; scar of goitre operation. Nothing abnormal in lungs or heart. Infection of left arm and left thumb, infection extending by lymph chain and by tendon sheath.

Incision and drainage of flexor surface of thumb and above annular ligament. Small amount of pus from thumb incision. Blood count on entrance was 24,000, 91 per cent polys. Culture from pus from thumb showed staphylococci.

Infection continued to extend in this arm, and it was again opened and drained on May 9th, much pus and necrotic tissue being removed. On May 17th, x-ray showed no evidence of bone or periosteal change, although infection had continued to extend. On May 18th, an incision was made on outer side of fore-arm just above ulnar styloid extending 3 in. up, and another incision of one inch opposite the radial styloid; through and through drainage between these two; another two inch incision in the upper fore-arm internal to the ulnar region, with through drainage to the lower incision. On June 15th, further incision and drainage. On June 29th, x-ray showed extensive periostitis of the ulna along the entire shaft of the bone nearly to elbow, with irregular involvement of the carpus and in phalanges of third finger.

Blood counts. June 14, 13,000, 83 per cent polys; June 17th 15,200, 81 per cent polys; June 29th, 12,800, 76 per cent polys.

The various remedial measures are not detailed here, although they appear in the clinical record.

DR. BROCKWAY:—I have wondered what lesson we could learn from this case. There is nothing new or interesting about infection of the arm, except the lengthiness of it. It was a staphylococcic infection originating from a needle prick. It was very rapid in development. I saw it within 12 hours from the onset and it then showed reddening of the fore-arm. We thought we got at it very quickly, and cannot yet see where we were slow or negligent. The original wound was opened; the extension was all on the flexor surface and apparently tendinous rather than lymphatic. The most and perhaps significant fact was that it was hard to find localized pus; it is possible that pus was present and we did not find it, but I think not. This woman was very subject to staphylococcic infection; in one season she had ten infected fingers and had lost five nails, as well as having many smaller slight

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infections. She was under my care until the middle of June, and then passed into other hands when I became sick and afterwards went on vacation. She was in the hospital three months. I saw her on Aug. 12th; hands and fore-arm are now normal size, with only slight oozing from two or three of the many incisions.

She had many exacerbations with fever and temperature, between which would be periods of improvement. We thought the surgery was done as rapidly and as promptly as was called for. We had many consultations and more radical measures were considered but decided against.

In spite of the great care used, am a little inclined to think that the surgery, in spite of the deceptive appearances, should have been done a little more promptly at several stages, although not more thoroughly than it was done at any time. The question always arises, in extensive hand and arm infection, whether they are neglected. This was not neglected, but if I saw a case like this again, in spite of the fact that the purulent collections are not apparent on the surface, I would lay open the ulnar bursa the whole length, and follow with any other incisions necessary on the fore-arm, and with the palmar region open. Palmar region was never distended, though there was infection running from side to side.

Dr. Wylie operated, after the x-ray examination in June, which showed periosteal involvement.

DR. WYLIE:—As the doctor states, the first x-ray did not show bone involvement. The patient would have periods when she would appear almost well and temperature almost normal, and then in the course of a few hours the temperature would go to 103-4. I saw her a number of times in consultation; the question of amputation was always advised against. This last time when the x-ray report showed periosteal involvement and some bone destruction as well, the question of amputation came up again; in fact she came to the operating room expecting to have the arm removed. but the doctors in consultation went against the desire of the patient and refused to amputated. The periosteum of the ulna was divided from one end to the other; also the periosteum of one or two of the metacarpal bones was divided. After these incisions, the patient apparently recovered. Whatever function she has will be so much saved, as no one thought she would have anything but a claw, if she made recovery.

Ques.—Was the staphylococcus the only organism found? Yes, this was found a number of times.

DR. WILKINSON:—There is nothing to be said in way of criticism of the treatment. In cases of this kind where it is apparent that the patient lacks resistance, the ultraviolet light and sunbath are indicated. If we had equipment in this and the other hospital, we might add much of benefit to this type of case.

DR. BROCKWAY:—Did not say anything about the treatment. We used some of the more common things. Protein therapy was used. Murcurochrome gave apparently temporary results twice. but only temporary. Dr. Sweek's nitrified air was used in one exacerbation.

DR. GREER:—This is a very interesting subject. We all probably think that if the case had been treated differently, the outcome might have been different. We have had several such infections in the past few years and have been using the Alpine light. We have one case on hand now, after four months, with bone involvement much like this case; we have used everything and do not think that the case is any better. When you try to analyze these cases, you hardly know what to think. Some man comes along and says use deep milk injections, another says use the Alpine light, and they can all cite cases. We have some cases treated with the Alpine light that cleared up promptly, but the question always comes as to whether they would not have cleared up anyhow. Whatever you do you will have cases that do well and cases that do not do so well.

Ques.—Were any blood sugar estimations made? Am not sure; of course there was no urine sugar.

DR. DYSART:—Have seen a case of osteomyelitis beginning on Sunday and ending on Wednesday in death.

Following the presentation and discussion of these cases, the proposed new constitution was read by the secretary, and discussion called for. Staff organization and attendance was discussed and means of securing more regular interest in the meetings. Motion was made by Dr. Carson and seconded that the meeting night be changed to the second Monday evening. This was put to a vote and carried, and the staff meeting night in the future will be on the second Monday.

There being no further business, the staff adjourned to meet Monday night, October 11th.

W. WARNER WATKINS,
Secretary.

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